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VOL. II.—31ST YEAR.

SYDNEY, SATURDAY, OCTOBER 14, 1944.

No. 16.

COMMONWEALTH OF AUSTRALIA ——— DEPARTMENT OF HEALTH

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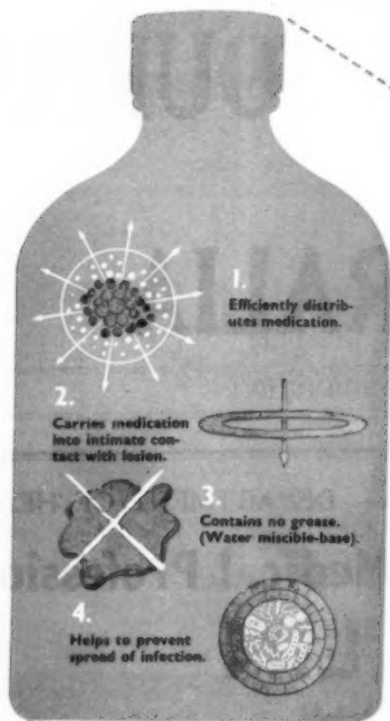
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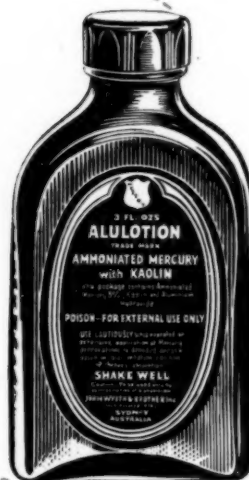
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### TROPICAL DISEASES IN RETURNED SOLDIERS.<sup>1</sup>

By H. HUME TURNBULL,  
Colonel, Australian Army Medical Corps.

It is not my intention to attempt any wide survey of tropical diseases or any description of any of them, but I shall try to review the ways in which these diseases are likely to force themselves on the attention of the practitioner at home in his work amongst men discharged from the forces. I do not want to weary you with information which is readily obtained from text-books and monographs, even when it is not well known to you; but I shall try to give you the results of our experience of the difficulties which have already declared themselves either to service or to civilian medical officers, and to direct your attention to the traps and pitfalls with which such diseases surround the unwary.

As we are dealing with Europeans living under good conditions and receiving a satisfactory diet, many of the troubles which are met with in undernourished native populations are unlikely to be seen. Although the major medical problem in the war in New Guinea has been the prevention and treatment of tropical diseases, the field is limited, as only four have been prevalent and of these one, dengue fever, being of short duration and leaving no harmful after-effects, need not concern us. Cases have been quite common in the north and north-eastern States for many years and the disease is well known there.

#### Malaria.

The disease which will be and even now is of great importance to us all is malaria. Although our work is done so comparatively close to great centres of this disease, Australia has in the past been so shut off from the rest of the world that we in the southern States rarely saw a patient suffering from malaria. If such a patient

was admitted to hospital, the condition was regarded with special interest as a rare disease, and when blood slides showing plasmodia were handed to sixth-year students in clinical pathology examinations, the test was regarded as scarcely fair. As a result it must be confessed that most medical practitioners have not learned anything real about the disease and therefore find themselves much at sea when confronted with its many manifestations. It is the bounden duty of all who practise medicine in any part of Australia to read and know enough about the disease to enable them to recognize and treat it effectively, because most practitioners will need such knowledge in the next few years, and because ignorance and delay may cost the lives of some of the best men in the land.

Owing largely to the drive and initiative of Brigadier N. H. Fairley, Director of Medicine, Australian Military Forces, a great deal of new knowledge of this disease has become available, and much more definite statements can be made concerning the value of drugs than were possible some years ago. "Atebrin", which was only coming into use gradually before the war, has, largely owing to acquisition by Japan of 90% of the world's quinine, been tested thoroughly and proved to be a valuable drug.

It is not necessary, even if it were wise, to discuss all that is known as to the action and uses of the various drugs; but it is clear that the present routine course of treatment followed by 0.1 gramme of "Atebrin" per day for six weeks will produce cure of malignant tertian malaria in almost 100% of cases. This does not apply to benign tertian malaria; we know no drug that will cure this infection, although the routine treatment rarely fails to terminate an individual attack, and the maintenance course of "Atebrin" will stave off early relapse and allow the patient to be restored to health. Every soldier who lands in Australia from New Guinea or the islands is given a supply of "Atebrin" sufficient to last for six weeks, with instructions to take one tablet (0.1 gramme) every day. If he does this he is safe, he will not die of malignant tertian malaria, and he almost certainly will not develop an attack of benign tertian malaria, though a relapse due to benign tertian is quite likely to develop about three

<sup>1</sup> Read at a meeting of the Victorian Branch of the British Medical Association on August 2, 1944.

weeks after he stops taking his drug. If, however, he is careless and fails to take his tablet each day, he is likely to have a malarial attack which may be a sudden and intense cerebral attack or some other form of malignant tertian infection producing a rapidly fatal result. This has happened in four or five cases, and other men have been admitted urgently to military hospitals and saved by prompt and vigorous treatment, so that the danger is a real one. It is therefore important that all medical practitioners should aid by stressing this danger to all whom they can influence, because in many cases the men are encouraged by their friends and relatives to give up taking their tablets under the plea that they are harmful or unnecessary. When you hear this statement or any like it made, I implore you to attack it most strenuously and preach the gospel of truth vigorously. I have even heard that doctors have advised men that there is no need to continue "Atebrin" during their leave because the drug is toxic, and anyhow, if an attack should develop it can be treated. As I have shown, the latter part is a dangerous half-truth, and with regard to the former part, tens of thousands of men have taken "Atebrin" for long periods of time without the development of symptoms of any significance whatever.

For a considerable time two statements gave some trouble. These were: (i) "Atebrin" will cause sterility in a proportion of the men who take it; and (ii) "Atebrin" damages the liver. There is no shred of evidence in favour of either statement, and both can be contradicted with the utmost confidence. The first is, of course, just a change from the old lying tale about quinine, but with the difference that, whereas quinine in high concentration *in vitro* does damage spermatozoa (although it has no such effect in any possible therapeutic concentration), "Atebrin" even *in vitro* does not damage them in any way. The "liver damage" story probably arises simply from the yellow staining produced by the dye, and we have seen nothing to support it, while pathological examination of livers from men who have died from wounds or disease while taking routine suppressive doses of "Atebrin" have shown no sign of damage which could be ascribed to this drug.

If all doctors preach the great importance of continuing suppressive treatment with "Atebrin" in the way directed and stress it whenever they can, we may be sure that tragedies and near-tragedies from cerebral malaria will be reduced greatly, because then the relatives of the men will help and encourage them to continue the treatment, instead of scoffing at it or trying to make them stop, as is sometimes the case now. Of course, some stop taking "Atebrin" with the idea that an attack of malaria towards the end of their leave would not be a bad thing; but the risk is too great, and they should know of it. These facts are made clear to all men before they go on leave; but great assistance can be given by civilian medical practitioners, who are regarded as unbiased judges, while service medical officers may be suspected of dressing the story up a little—at least by the men's friends. The very low mortality rate of malaria in military hospitals, about 30 deaths for the whole of the war in the South-West Pacific Area, has encouraged a much too casual outlook in a number of people.

What, then, are the risks to men who have finished their service and been discharged in the ordinary way as medically unfit or after their course of "Atebrin" is finished? To such men the risk of an attack of malignant tertian malaria is very slight indeed, and even if they have been careless with the drug, is practically negligible after three months; but benign tertian relapses are certain in a considerable proportion, and the doctor must be constantly on his guard. Here there is not the risk to life, for benign tertian malaria does not kill men in good general health; but it may give rise to much ill-health and may be dangerous in association with other illness.

When a man is infected with malaria, many things tend to cause an attack, such as chill, cold bathing, another illness, blood loss, anaesthesia and operation, and such relapses are apt to occur for a period of three years or rather more after the patient leaves a malarious area. It is well to remember that rises of temperature after opera-

tion may be due to malaria and not to sepsis. The only safe rule is to regard malaria as a possibility in every illness, and to make thick and thin blood films for examination before any anti-malarial drug is given. This need entail no loss of time, as the drug can be given immediately, and if the films yield negative results no harm is done.

One examination with negative results is not necessarily final. Especially if suppressive drugs are being taken, parasites may be hard to find; men may die of cerebral malaria without the discovery of parasites in the peripheral blood, thick films are not easily interpreted except by practised pathologists, and long search of thin films may be needed in some cases. Thus if delay seems dangerous, treatment should be begun at once; but as the use of anti-malarials will probably remove one's chance of an absolute diagnosis, it is better to wait for a definite finding in any uncomplicated case of probable benign tertian malaria. Where malignant tertian malaria is a possibility, treatment should begin at once.

The recent circular letter issued by the Director-General of Health for the Commonwealth contains a concise but complete account of the types of malaria which are likely to confront the medical practitioner here and also of the manifestations of severe malaria which he is likely to meet, and I shall call special attention to only a few points.

1. The first symptoms may be comparatively mild, just headache and vague ill-health with quite moderate temperature, and may be mistaken for influenza or other common ailment for the first few days when cure would be simple; then a sudden attack of unconsciousness or even a convulsive seizure occurs and the prospect of cure is greatly diminished. This has happened in several fatal cases.

2. There is nothing distinctive about the temperature, and it is often not high in the early stages.

3. The spleen, though always enlarged, is often soft and impalpable.

4. Herpes is common.

5. Abdominal pain is quite common, also severe vomiting and the frequent passage of loose stools with mucus and sometimes blood. If the pain and tenderness are located over the caecum or if jaundice is present with it, a surgical condition may be suspected and operation performed. Operation will often precipitate a severe attack, and even if there are no symptoms of the disease, it is wise to have the blood examined before a patient who has recently returned from a malarious area is operated upon.

6. Cerebral malaria may come on rapidly with delirium and acute excitement, or more often with increasing drowsiness, coma or convulsions. Altered reflexes and pareses are common.

The lesson is that malaria must be remembered and excluded whenever a man who has recently returned from a malarious area is the patient. Suspected heat stroke is usually malaria.

Although the value of skilled pathological examination is great, cases do occur in which no parasites can be found in the peripheral blood, so that their absence does not exclude malaria in acute illness, and their presence, though proving malaria, does not exclude other diseases.

At a later date, when the condition to be considered is only a relapse of benign tertian malaria, we find that the patient is apt to put down any symptoms to his old complaint, and here it is important to withhold anti-malarial drugs till the diagnosis is confirmed. This is quite safe in such cases, and is the only way to make sure whether the disease is still present or not. Some men who acquired malaria in Palestine in the last war believe that the disease is still present, though it has certainly died out long ago. In benign tertian malaria the routine treatment with "Atebrin" as laid down in the circular is quite satisfactory.

There is some debate as to whether "Plasmoquine" is necessary or not; though it is included in this routine course, it is not needed for the cure of the attack. Its real

value is in the destruction of the gametocytes of malignant tertian malaria, which are not affected by quinine or "Atebrin", though these drugs do destroy the sexual forms of benign tertian malaria parasites. The use of "Plasmoquine" in India was followed by a great diminution in the rate of relapse of benign tertian malaria, but no such effect has been shown with the New Guinea strains of the parasite, and if benign tertian malaria parasites were the only infectors it would not be needed. It is wise, however, to use it in the first two relapses unless frequent pathological examinations are made, in order to avoid any chance that a malignant tertian infection may have been overlooked, so that infection of local mosquitoes with its gametocytes has been possible. Thereafter, however, it is unnecessary.

Do not forget that a "false positive" serological reaction for syphilis may be given by the serum of a patient with malaria. The "false positive" reaction may occur whether precipitation (Kline, Kahn *et cetera*) or complement deviation (Wassermann) tests are used and may persist for several months at least. For this reason a positive serological reaction should not be accepted as decisive evidence of syphilitic infection in any person who (a) has malaria, (b) has recently had malaria, (c) has recently served in a malarious area, even if definite proof of malarial infection is lacking.

One risk which must be remembered is the danger of rupture of the spleen, which may occur as the result of quite slight trauma, even when the spleen is not greatly enlarged. The tear may be small, and hemorrhage may be slow at first without signs of a major catastrophe, or there may be a larger rent with the rapid appearance of grave symptoms and all the signs of massive hemorrhage. Apart from the usual signs of internal hemorrhage, pain is present under the left costal margin, worse on pressure and perhaps quite severe, and there is some rigidity in this area, while if the hemorrhage increases this may spread to the epigastrium; pain is also felt in the region of the left shoulder when the lower surface of the diaphragm is irritated. Blood examination may reveal little anemia at first (this obviously depends on the amount of hemorrhage). Treatment is, of course, surgical, and frequently urgent.

#### Dysentery.

Dysentery is the other disease affecting troops which is likely to cause concern to medical practitioners who have to attend the soldiers after their discharge. The disease has been quite common throughout the campaign. No doubt bacillary dysentery will always be a worry, because it is widespread over the world, and the native population almost always contains some carriers, so that, even if the troops are quite free and their hygiene is perfect (in itself a dream), any contact with the natives is very apt to produce some cases.

Dysentery was a grave menace in the early days on the Kokoda trail, when the Japanese, amongst whom the disease was rife, had fouled the country extensively; but this serious danger was overcome by the use of sulphaguanidine, all available supplies of which were rushed right up to the units, and every man with diarrhoea was treated at once. The result was magical, and to the constant use of this drug must be ascribed in large part the fact that in the whole campaign with its manifold opportunities for infection, and indeed its many infections, only three men have died from dysentery. In one of those cases no sulphaguanidine was given, while in another all except two or three ulcers had healed when the patient died from an associated infection of the bladder. This drug is now obtainable for general use, and it seems likely that if it is used at once in cases of true dysentery, not only will the result in the individual case be greatly improved, but local epidemics may be prevented and the incidence of the disease in the community diminished.

There is no doubt that some patients, though symptom-free, do pass virulent bacilli in their stools, and although their number may be greatly diminished by routine sigmoidoscopic and pathological examination of stools or mucus in convalescence, it is unlikely that this routine will be carried out in all cases, and the use of a specific

drug should help greatly in diminishing the number of such potential disseminators of disease.

From time to time one sees articles in the medical journals recording toxic symptoms suffered by patients treated with sulphaguanidine. Most of the descriptions are extremely unconvincing, and in one, in which 50% of patients showed mental symptoms, there seemed little doubt that these were practically all psychoneurotic in origin. In a very large number of cases we have seen nothing to suggest that more than the most ordinary care is needed, and no symptoms of any significance have been reported. Sulphaguanidine is not absorbed freely from the alimentary tract and the concentration in the blood is low; but in rare cases enough may be absorbed to cause symptoms and a large fluid intake must be assured. This is essential in the treatment of the disease in any case. The drug is given as a powder stirred in a glass of water.

Originally it was recommended that treatment should begin always with the administration of a moderate dose of a saline purge, but this is not necessary, and specific treatment may be begun at once. Full doses are advisable; a beginning should be made with 0.1 gramme per kilogram of body weight every four hours till the number of stools passed per day is not more than five, and thereafter 0.05 gramme per kilogram should be given every eight hours till the stools have been normal in number and consistency for two days. Thus the usual dose is seven or eight grammes for the first dose and three to four grammes thereafter, and usually some 90 to 120 grammes are needed for a full course. Some observers think that smaller doses are quite effective, but there is evidence that such a course is followed by some failures and a larger number of carriers, and as there is no reason to fear full doses, it is wiser to use them.

The length of the treatment may, of course, be varied in accordance with the type of case; but unless full doses are used results in severe and chronic cases are much less satisfactory. Rarely constipation and abdominal discomfort during treatment require sodium or magnesium sulphate for its relief.

Sigmoidoscopic examination is valuable in convalescence and for patients who later on complain of bowel symptoms, diarrhoea, discomfort *et cetera*, but remain in good general health, and whose stools contain no blood or mucus, or any pathogenic organism. Such symptoms frequently become fixed as a neurosis unless the condition is recognized early and definite reassurance and appropriate treatment are given. Many such patients are still receiving treatment and leading unhappy lives following dysentery in the last war; but with the help of sulphaguanidine and the sigmoidoscope there is good reason to hope that the numbers will be greatly reduced this time.

#### Amoebiasis.

Amoebiasis, due to infection with *Entamoeba histolytica*, is of course not uncommon in Egypt and the Middle East, and though it is rarer in New Guinea, a certain number of amoebic infections are acquired there. The disease exists in Australia, and I have had one case of a patient who had never been out of Victoria, so that when a man is found to be harbouring cysts it is difficult to know where he was infected. However, this disease is one for which the medical practitioner must keep a close lookout. There may be a definite dysenteric attack with the frequent passage of stools containing blood and mucus, or the complaint may merely be of abdominal discomfort with pain and tenderness in the iliac fossæ or flatulent dyspepsia, or of short attacks of simple diarrhoea with no characteristic features. Perforation may occur, and this complication is almost invariably fatal.

It is important to determine whether there is any involvement of the liver, as shown by tenderness over the liver or enlargement of that organ or by pain in the right shoulder, and to make sure whether vegetative forms of the amoeba are present (denoting an active attack) or only cysts (showing a latent infection). If the only signs are tenderness over the colon and thickening of that organ, and if no vegetative forms are found, the best treatment is by emetine bismuth iodide by the mouth,

while in amœbic hepatitis injections of emetine must be given and followed later by a full course of emetine bismuth iodide.

In the treatment of an acute attack the patient must be put to bed and kept on a light diet, though no very severe restrictions are necessary. A dose of sodium or magnesium sulphate (two to four drachms) at first is useful, and if pain is severe and resists simple nursing measures such as the application of hot fomenta, the administration of morphine or of *Tinctura Opii* may be necessary, especially at night. Rest is essential in every acute disease, and an effective dose of morphine may be of the utmost value by allowing the patient to get sleep at night. The specific drug used against the entameba is emetine hydrochloride, which is given by intramuscular injection in a dose of one grain once each day for not more than ten days. This drug sometimes, though not often, causes nausea and occasionally vomiting, and in large or continued doses may give rise to diarrhoea; it is also said to be a poison to somatic and cardiac muscle. Its poisonous effect is insisted on by all tropical physicians, so it should be kept in mind especially in the case of weak patients; but it is only in such cases that this danger is to be feared, and the drug is thoroughly safe used in proper doses with reasonable care. It does, however, accumulate in the body, only about one-third of a grain being destroyed in twenty-four hours, so that a course should not last more than ten days and thereafter no more should be given for three weeks. After a course of emetine, 0.25 gramme of carbasone should be given twice a day for ten days. Emetine, though effective in acute attacks, is ineffective against cysts, and patients who have relapses or are cyst carriers are treated better by emetine bismuth iodide combined with retention enemata of "Yatren" (2%).

The identification of the entamebia is not easy, and if the patient is not within easy reach of a pathologist skilled in this work, it would be wise to send him to hospital at a centre where such help is available, because the accurate diagnosis of the condition is important in view of future possibilities. Sigmoidoscopy may be invaluable in diagnosis. The chief risk, of course, and one which must be kept constantly in mind, is amœbic hepatitis or its later development, amœbic abscess of the liver. This is often not recognized until too late, and a condition which in the early stages is curable may cause death. In rare cases the duration of symptoms before the fatal termination is short, but usually there is time for effective therapy. The initial infection in these cases is in the intestine; but it may not have manifested itself by clinical dysentery, and the patient may not know that he has been infected.

Amœba are carried up via the portal vein and deposited in the liver, where the enzymes from them cause local necrosis, and the fusion of adjacent foci gives rise to an abscess which is most commonly in the right half of the liver, but may be in the left half, or abscess formation may occur in both sides. The original infection may have occurred years before the onset of hepatic symptoms or may precede them by a period of only days or weeks.

The onset of hepatitis may be insidious and the symptoms equivocal, so that a constant watchfulness is required if a mistake is to be avoided. Amœbic hepatitis may give rise to no symptoms except a regular remittent fever and sweating for some time, and although some enlargement of the liver is usual, no pain, tenderness or epigastric discomfort may be present. Abnormal signs at the base of the corresponding lung are unlikely unless the condition approaches the diaphragmatic margin and the leucocyte count is not high. In abscess of the liver these symptoms continue, and as the abscess develops the liver becomes enlarged and pain and tenderness become more definite. The temperature is high with sweating, and rigors may occur, while the general health fails progressively, with loss of weight and strength, furred tongue, anorexia, dyspepsia, bowel irregularities, moderate anaemia and a rise in the number of leucocytes varying from 10,000 to 20,000 per cubic millimetre. Jaundice is rare, but may occur. Signs at the lung base appear if the abscess is approaching the upper surface of the liver—at first a deficient percussion note with diminished respira-

tory murmur, later bronchial breathing, and then perhaps signs suggestive of pneumonia and later pleural effusion. The abscess may spread through the diaphragm and involve the lung, with the production of a pulmonary abscess. Hæmoptysis may occur, or the abscess may rupture into a bronchus and large amounts of pus, of the colour and consistency of anchovy sauce, may be coughed up. This may lead to spontaneous cure, especially if emetine is given.

If the abscess involves the lower half of the right lobe the liver is enlarged downwards and tender, while the muscles over it are tender and rigid. A definite tender spot may be demonstrable, and an obvious bulge may be seen. Pain is variable, and at first may be felt only at night and especially if the patient lies on his right side; but usually it is present about the hypochondrium and also in the right clavicular region. It may be felt lower down the abdomen over the caecum, and appendicitis may be wrongly diagnosed. Abscess in the left lobe of the liver may simulate gastric conditions and may be less obvious, presenting perhaps in the epigastrium while tenderness and rigidity are found in that area.

It is obvious that many conditions, both supra-diaphragmatic and infra-diaphragmatic, may be simulated, and the diagnosis between infected abscess and suppurating hydatid cyst may be difficult. X-ray examination is of great value, and may reveal only diminished movement or a rise in the height or definite humping of the diaphragm, as well as aiding in the interpretation of the basal lung signs. Stool examination may reveal amœbæ or cysts; but the fact that they are not found does not exclude amœbiasis. Sigmoidoscopic examination may reveal ulceration, and amœbæ may be obtained by scraping the base of any ulcers; but usually they are not seen at this stage. The leucocyte count in uncomplicated abscess is not very high (about 10,000 to 20,000 per cubic millimetre); but in infected abscess much higher counts may be found, 95% of the cells being neutrophile. If a patient has an unexplained rise of temperature and suspicion of hepatitis is aroused, a course of emetine may be given, and if the diagnosis is correct a dramatic fall in temperature usually occurs within seventy-two hours unless the abscess is infected. In such a case a full course should be followed by a course of carbasone. When abscess is suspected and emetine does not produce cure, exploratory puncture and aspiration of the liver for pus are necessary.

#### Scrub Typhus.

Scrub typhus is mentioned here chiefly because it has been a common disease among the troops in New Guinea, and has been the cause of a number of deaths. For this reason the idea has grown up in some quarters that men who have suffered from severe attacks will be damaged permanently, at least to some extent.

In very severe cases considerable peripheral circulatory failure may occur, and some toxic changes and cellular infiltration of heart muscle have been found on microscopic examination. From this it was argued that selective cardiac damage occurred, and that the men would show signs of weakness after recovering from the acute attack.

Hundreds of patients have now been watched through convalescence and have resumed their work, and it can be stated with confidence that they all recover completely and without any weakness at all. To quote a report from a convalescent depot through which many of these men passed: "Scrub typhus convalescents made quick recoveries in four to eight weeks and returned fit to their units. After their recovery from the initial debility and tachycardia these cases made better recoveries than recurrent malaria cases." This is the experience in the much more serious rat-borne epidemic typhus, in which sequelæ are rare though the mortality rate is very high indeed. It is important to stress this fact, because if the doctor believes that permanent cardiac damage is likely to follow a disease and he finds a convalescent whose pulse rate is increased and who complains of palpitation and shortness of breath or precordial discomfort on exertion, he may become alarmed or at least cautious, and by advising care and restricted exercise may fix a

state of cardiac neurosis which soon becomes quite beyond effective treatment. He can, however, confidently assure the man that scrub typhus does not permanently affect the heart, encouraging him to undertake all the usual exertions suitable to his general state. The period required to return a man fit to his unit is rarely more than four months, even in cases in which the attack was severe.

#### Schistosomiasis (Bilharziasis).

Schistosomiasis has not been common, but a small group of cases has occurred and others may occur later. All these were cases of urinary infection by *Schistosoma haematobium* with resulting bladder irritation and hæmaturia, but infections by *Schistosoma mansoni* may also have occurred, giving rise to bowel symptoms.

In infection by *Schistosoma mansoni* the worms enter the portal system, especially its mesenteric branches, ova being deposited in large numbers in the colon and liver and in lesser numbers in other abdominal viscera. In the case of *Schistosoma haematobium* they travel via the inferior hæmorrhoidal plexus into the pelvic plexuses of veins, and eggs are deposited in the lower portions of the urinary and genital tracts. The egg deposits cause considerable inflammatory reaction, at first giving rise to small pseudo-tubercles, and later papillomata or ulcers may develop, while chronic fibroid thickening and the so-called "sandy patches" are characteristic of the chronic stages with calcified eggs. These lesions may be seen with the cystoscope. Pulmonary fibrosis may occur from the deposition of eggs in the lungs, but there is little involvement of the liver and colon. It is only the more chronic and local lesions which are likely to be seen in discharged soldiers, and by this time eosinophilia is frequently absent.

The local symptoms do not usually appear until several months after the initial infection, but thereafter they may continue for many years while the subject retains fair general health. Brigadier Fairley quotes one case in which the diagnosis was first made twenty-seven years after infection, though frequent attacks of hæmaturia had occurred during that time.

Early symptoms are scalding or frequent micturition with discomfort about the suprapubic or perineal area or in the penis, and the passage of bright blood at the end of micturition. At this stage the prostate may be congested and tender, cystoscopic examination reveals characteristic yellow, round pseudo-tubercles, and the urine contains leucocytes and erythrocytes and typical terminal-spined ova. For years intermittent hæmaturia may be the only clinical manifestation, but later cystitis may occur with or without renal involvement, and papillomata and finally carcinoma may develop, which may be the cause of death.

In *Schistosoma mansoni* infections bilharzial dysentery may be present, associated with tenesmus and with the passage of blood and mucus, and between attacks rectal discomfort may be felt, though the stools are solid and coated with mucus which may contain the lateral-spined ova. Papillomata and later carcinoma may result, and periportal cirrhosis with ascites and splenomegaly are seen in the late stages.

In the early, toxic stage the diagnosis may be suggested by the intense eosinophilia and confirmed by the complement fixation reaction (Fairley), while in the localized stage the diagnosis is usually made by the finding of the ova in the excreta; but the complement fixation test, the intradermal skin test and the cystoscopic and sigmoidoscopic findings are of great value. Several examinations may be necessary before the ova are found.

Two trivalent antimony compounds are specific against the adult worm; these are tartar emetic and "Fouadin". During treatment rest in bed is advisable. Tartar emetic is given intravenously in ten cubic centimetres of saline solution every second day; the initial dosage is 0.5 grain, and each dose is increased by 0.5 grain till a maximum of 2.0 grains is reached. The solution must be freshly sterilized, and a full course consists of thirty grains. The drug kills the schistosomes, and viable ova rapidly disappear from the excreta. The drug is generally well tolerated, though cough, vomiting and muscular pain may follow its administration; but great care must be taken to see that none of the solution escapes into the tissues, as

it causes necrosis. "Fouadin" is given by intramuscular injection, the whole course of forty cubic centimetres taking fifteen days; the results are not so good as those obtained with tartar emetic. Complications may require treatment, and polypi which persist may need removal by the electrocautery.

#### Ankylostomiasis (Hookworm Disease).

The hookworm is common in New Guinea, and a number of men have been infected by it. The larvæ can live for a long time in moist earth or muddy water and infect man either via the alimentary canal or more commonly through the skin. Those which enter through the skin are carried in the blood or lymphatics to the lungs, where they burst through the alveolar walls and reach the small bronchi; thus they pass through the trachea to the mouth and are swallowed. The worms develop to maturity in the duodenum and jejunum, where the females lay their eggs; these appear in the stools two or three months after infection. The worms which attach themselves to the mucous membrane of the intestine cause mucosal hæmorrhages, and as they may be present in large numbers, anæmia may be caused. Healthy men receiving a good diet have few or no symptoms as a rule, but weakened men or those who have a heavy infection may experience ill health. In many cases the diagnosis has been made because a well-marked eosinophilia has been found when blood films were examined for malaria; but some subjects have complained of epigastric discomfort and dyspeptic symptoms. Epigastric tenderness is common, with flatulence and more often constipation; but in troops symptoms have rarely advanced beyond this stage. Anæmia has been present at times, but it does not seem that it has been due to the worms; no doubt this is owing to the fact that the men were taking an adequate diet with plenty of meat and iron. A history of "ground itch" was variable, and eosinophilia, though often present, was by no means universal.

In the large majority of cases it was not clear that any of the symptoms present were actually due to the worm, and many men in good health were found to harbour as many worms as those who were anæmic; this suggested that the hookworms were not the whole cause of the trouble. The spleen is never enlarged as a result of ankylostomiasis, and there is little loss of weight.

Blood examination in severe cases reveals a hypochromic microcytic anæmia, the erythrocytes numbering 3,000,000 or even as few as 1,500,000 per cubic millimetre, and the colour index being low. Eosinophilia is the rule, 10% to 40% of the leucocytes being eosinophilic cells; the total number of leucocytes is about normal in most cases. Megalocytic anæmia does not occur as the result of uncomplicated ankylostomiasis.

In light infestations a single routine examination of the fæces may not reveal ova, and some method of concentrating ova in the fæces may be required.

The best available treatment is the administration of tetrachlorethylene in a single dose of four cubic centimetres either in a gelatine capsule or shaken up with 0.5 to 1.0 ounce of magnesium sulphate in water; if it is available, one cubic centimetre of oil of chenopodium should be added to the mixture or given in a gelatine capsule. The drugs are given in the early morning on an empty stomach, no food is permitted till the bowels have been opened, and another dose of 0.5 ounce of magnesium sulphate should be given after three hours if necessary.

The effectiveness of the treatment is determined by the disappearance of symptoms, and by the absence of ova from the fæces on examination about ten days later. If ova are still present, another course of treatment is advisable.

#### Other Worm Infestations.

Other forms of worms have not given trouble and need not concern us. No case of infestation with *Tania solium* has occurred.

#### Acknowledgement.

I wish to thank the Director-General of Medical Services for permission to publish this paper.

# EXPERIENCES WITH A MOBILE SURGICAL TEAM ON AN AMPHIBIOUS OPERATION IN NEW GUINEA.

By GEOFFREY NEWMAN MORRIS,  
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Corps.*

All experience is an arch wherethro'  
Gleams that untravelled world, whose margin fades  
For ever and for ever when I move.

—TENNYSON.

In August, 1943, a surgical team was detached from an Australian general hospital to serve the troops of an Australian infantry division in the campaigns on the Huon Peninsula. This team consisted of two surgeons (a major and a captain) and three orderlies. The two surgeons shared the surgical work and in the quieter periods gave anaesthetics for each other. The senior of the orderlies was a classified operating room assistant who had worked in Tobruk and had been trained to a high standard of efficiency in the duties of assisting and sterilization. The second soldier was a nursing orderly who rapidly became used to operating theatre routine, and was responsible for the preparation of the theatre and the setting out of instruments. The third orderly was a batman, but his responsibilities far exceeded his duties as batman; he cleaned and prepared the patients for operation, washed the operating theatre linen and also organized a regular supply of hot tea for the theatre team during rush periods. A fourth orderly for general work round the theatre and for relief is advisable.

In the selection of orderlies for a surgical team it is essential to pick men of more than usual intelligence. Training is important, but natural intelligence is more so; an intelligent soldier will easily learn, a man who thinks he is well trained can in many cases not be taught.

The function of a surgical team is to provide surgical treatment for the wounded as far forward as possible, consistent with a reasonable degree of safety. In jungle warfare the phrase "as far forward as possible" refers to time and not to distance. With evacuation from the forward areas by native bearers, it may take up to twenty-four hours to bring the wounded comparatively few miles. The majority of casualties with which this surgical team had to deal could be brought most of the way by "jeep". Casualties reached the unit in varying periods—from one or two minutes for the victims of air attack, half an hour when the enemy reached areas adjacent to the dressing station, up to three days when small units had been cut off.

As a rule the work was done at the main dressing station of a field ambulance; but on one occasion, because of enemy action, it was necessary to evacuate the wounded from the main dressing station to a casualty clearing station further back, where the operating work was resumed. At no stage in these campaigns was it practicable to take the surgical team as far forward as an advanced dressing station.

The surgical team reached the field ambulance with which it was to work three weeks before D day. This enabled the team to take part in the last practice amphibious manoeuvre. This was of great benefit, as it enabled the members of the team to get to know well the men with whom they would be working. A surgical team relies on its "parent" field ambulance for everything from supplies to pre-operative and post-operative nursing, and the opportunity to meet and discuss plans with the commanding officer and members of the unit proved of considerable advantage.

In the initial landing at Red Beach for the attack on Lae the surgical team disembarked with the headquarters company of a field ambulance about an hour and three-quarters after the first wave of attacking troops. The site for the main dressing station, about a mile from the beach, had already been selected by an advance party. The first task was to clear areas for the operating theatre and resuscitation tents; this had to be done with careful attention to cover from the air. The best site is one in dense

"rain forest", which has tall leafy trees; only the undergrowth is cleared and the overhead trees are left for cover.

Casualties were not heavy at this landing. An American beach hospital was taking care of casualties from the beach, so there was plenty of time to set up the operating theatre. As the advance on Lae progressed, the team with its equipment moved up by sea at night to join another field ambulance which had "leapfrogged". Here again the operating theatre was set up on a new site under excellent cover. The majority of casualties were from bombs and they reached the main dressing station quickly. One Japanese prisoner was brought in suffering from a wound in the leg several days old. He seemed to be quite happy and, producing a Japanese-English dictionary, rapidly made his wants known.

After ten days at the second site, the team packed up and returned to its original field ambulance to take part in the landing at Scarlet Beach for the attack on Finschhafen. Here the landing was made in the face of considerable opposition from the shore; when the surgical team landed just over an hour after the first wave, fighting was still going on half a mile or so from the beach. The wounded lying on the beach were taken on to the site selected, and work immediately began on the clearing of an area for the operating tent. At the same time the theatre orderlies from the field ambulance started unpacking equipment and sterilizing instruments, with the result that the first casualty was on the operating table within an hour of reaching the site and within two and a half hours of being wounded. Well before this, ambulance medical officers had started resuscitation, and bottles of serum were hanging on branches of trees. This work was all done by members of the headquarters of the field ambulance and reflected great credit on their training. The surgical team was fresh to start work as soon as the operating theatre was ready.

There was a considerable volume of work to be done during the brigade attack on Finschhafen, which lasted several days, and there was also a number of casualties from aerial attack.

After four weeks at Scarlet Beach the main dressing station site was attacked by enemy infantry from close range, and evacuation of the patients, many of them still awaiting operation, was necessary. Patients were carried to the beach and evacuated by barge to a casualty clearing station a few miles down the coast. The surgical team and the surgeons from the light section of the casualty clearing station accompanied the casualties and continued work on their arrival. At the casualty clearing station the team worked in close cooperation with the surgeons of the unit for some weeks. The volume of the work was not heavy.

In preparation for the attack on Sattelberg the team moved forward again to a site already prepared by a field ambulance. In an hour and a half from the time of receiving notice to move, the operating theatre was dismantled and all the gear packed in 40 pound lots. A theatre of "Sisalkraft" had already been erected at this new site; this proved a great boon. Here two surgical teams were working together, and as the ambulance was serving a two-brigade front the work was heavy. Later the surgical team moved up the coast, but did no work, as the enemy was rarely contacted.

The team returned to its parent general hospital after being away for five months.

Major J. M. Yates, who commanded a surgical team on operations round Salamaua, in his official report describing his methods has pointed out the advantages of "Sisalkraft" in the erection of an operating theatre. In his experience it was possible to send forward, when advancing, a section of a field ambulance two or three days ahead, to prepare a site and erect a "Sisalkraft" shelter. In operations of the amphibious type, however, in which surgical treatment is required as soon as possible after the beach is reached, the time factor made this impossible.

We had taken with us an "E.P.I.P." tent, which has a double roof and is easily blacked out; it also has the advantage of not having a central pole. However, an "E.P.I.P." tent is heavy, especially when wet, needs several

men to carry it and takes up an uneconomical amount of room on a "jeep"; it also takes considerable time to erect. This tent was soon abandoned, as it was felt that its disadvantages outweighed its advantages, and an American pyramidal tent was used. This tent was much lighter and easier to erect and its central pole can be made on the spot; it has roughly the same amount of floor space as the "E.P.I.P." tent. It was essential to maintain a strict blackout, and for this purpose the walls of the pyramidal tent were liberally reinforced with army blankets, which served the purpose well. The corners and the entrance were the weak spots; but a double entrance porch made of saplings and blankets was erected. The blackout was on one occasion ruined by the fragments of a bomb which landed near by; but the use of plenty of adhesive plaster soon repaired the damage.

At first the tents were erected at ground level, but enemy aerial activity soon forced us down, and the tent sites were "dug in" to a depth of about four feet. The best way of doing this is to obtain the services of a bulldozer, which completes the job in a short time. This "digging in" meant that the patients on the operating tables were protected from bomb fragments flying at ground level. (The surgeons soon learned to "duck down" to this level, and on occasion to finish the work squatting on the floor.) The drawback of "digging in" was that it added considerably to the difficulties of drainage. Drains were dug round inside the four sides of the tent and led to a pit in one corner; saplings were placed in corduroy fashion on the floor, so that it was unusual to have to stand in mud.

The central spot for the treatment part of the dressing station was the operating tent. At Finschhafen we had two of these tents, one on each side of the main track through the station. One was run by the surgical team, and the other, in which a large number of the minor wounds was dealt with, by the surgeons and orderlies of the field ambulance. This arrangement enabled each operating theatre in turn to be aired and cleaned out on fine days, and one theatre and one team of orderlies were always ready for instant work. The patients were brought from the reception centre either to the "pre-operative" tent, if they had sustained minor wounds, or to the resuscitation tent, if they were suffering from shock. Both these tents were in close proximity to the operating theatres. There were several "post-operative" tents; one of these adjacent to the theatre and opposite the resuscitation tent was reserved for the most serious casualties. The paths between the various tents were marked out by white bandages running from tree to tree, a very necessary action to distinguish the paths during the night. It is extremely difficult to follow a winding path in the jungle at night in a complete blackout.

For the attack on Sattelberg there was time to erect a "Sisalkraft" operating theatre roofed with old galvanized iron left by the enemy. This was a great comfort; it was much more roomy and much cooler than a tent. It was large enough to hold comfortably two operating tables, "wash-up" basins and shelves for instruments, three stretchers for resuscitation screened from the operating area, and also a refrigerator; there was in addition an annex for sterilizing. When we were working in a tent, sterilizing, at night anyhow, had to be done inside the tent, and the heat and constant roar generated by three or four "Primus" stoves were most unpleasant.

Lighting arrangements as a rule were good, as both field ambulances and the casualty clearing station had generator sets. The equipment scale of a surgical team includes two "jeep" headlights with a battery; but these were not obtainable at the beginning of the campaign. Occasionally the generator would not work (one was put out of commission by a bomb at Scarlet Beach), occasionally it was silenced on purpose when the enemy was in the vicinity; we then had to use a Tilley pressure light. Once the only light available was one kerosene lantern; an appendicectomy was performed during an air raid by this illumination. We were lucky enough to obtain from one of the landing craft, which had been put out of action, a large two-cell signalling lamp, which gave excellent service as a spotlight.

The equipment provided was first class, and the supplies of expendable stores were always adequate. In all, including tent and autoclave and axes and other tools, the total weight of the equipment was about 1,500 pounds. This is rather more than can be carried on a "jeep" and trailer; but by cutting down on the expendable stores and by bulk loading some of the least essential items this weight was cut down to 1,000 pounds, and it could easily be moved on and off barges by the five members of the team in a few minutes. It has been pointed out that if it is necessary to send forward a surgeon to an advanced dressing station, he can cut down his essential gear to a weight of 400 pounds. It was anticipated at the beginning of the campaign that transport in some cases would have to be by native "carry", so that all the equipment with the exception of the tent was divided into 40-pound lots. In the absence of scales and weights, a 40-pound tin of plaster of Paris was used as a balance, and a large set of scales was erected by means of a tree, a length of iron piping and trays made from bamboo. As far as possible the gear was divided, both instruments and expendable stores, so that the loss of one or two boxes would not interfere with the ability to carry out the necessary work. The only difficulty experienced was with the autoclave; but this was divided into stand, barrel and lid, and each of these parts wrapped in hessian weighed little more than 40 pounds.

Because of the uncertainty of the conditions at the "far beach" for the landing near Lae, it was decided that the members of the surgical team should carry in their packs or in their hands sufficient gear to perform operations immediately on landing. Personal gear, cut down to one change of clothes, a towel, mess gear, toilet articles and cigarettes, was carried in the haversack and basic pouches, the pack being left free. A minimum of instruments to carry out an operation was selected, one dozen haemostats, two pairs of scissors, one set of retractors, two pairs of tissue forceps, skull forceps, amputation saw, scalpels, needles and suture material were packed in a small fish kettle sterilizer together with catheters, a Ryle's tube and "Pentothal" (which was the only anaesthetic agent taken). Two "Primus" stoves, two sealed Johnson and Johnson drums of sterile gowns and dressings, a two-gallon tin of "Dettol", kerosene and methylated spirits were taken; the spare corners were filled in with field dressings. This amounted to a pack weighing about 35 or 40 pounds for each man, in addition to a drum of dressings or a tin of kerosene; each man carried an ax or saw or shovel as well. By the time the team reached the site of the main dressing station, all its members were fatigued and not at all ready for work. The headquarters company of a field ambulance is equipped with nearly all the surgical gear that a surgical team has, and it has about 60 or 70 men available for carrying. A system of packing, devised, I believe, by Lieutenant-Colonel Tomlinson, was employed by the field ambulance to which the team was attached. Four-gallon drums were lined with old gas capes and fitted with lids. These drums were packed with essential surgical gear and made waterproof. Each weighed somewhat less than 30 pounds. Two rings of wire were passed round the circumference and connected with a wooden handle, so that the drum, stood on its end, looked like a gigantic beer mug (and, of course, the troops soon used this name). Because of this excellent system, it was thought unnecessary for the members of the surgical team to carry emergency gear themselves, and at the landing at Scarlet Beach the surgical team used field ambulance equipment until the "jeeps" arrived from the beach. These "jeeps" actually arrived at the site within half an hour after the troops arrived on foot—a great achievement for the shore engineers of our Allies.

Native "carry" was never used for our equipment, but the fact that all the gear was done up in 40-pound lots facilitated moves on and off barges and "jeeps" which were frequent. This division of the equipment into "one man" loads before starting means a great saving in time, especially if careful lists of contents are kept.

The layout of the operating theatre and the routine of duties were based on the report already quoted of Major

J. M. Yates, to whom grateful acknowledgement is made for help obtained from this report.

Opposite the entrance along the whole of one wall was a series of shelves made from the cases used for packing; on these were kept all the equipment—anaesthetic agents and syringes at one end, instruments and sterilizers at the other, with lotions, plaster of Paris, dressings and so on arranged in order between, the commonly used articles being on top. One large table was placed in the centre of the tent. This was covered by a sterile sheet and a set of instruments set out on each side. The less commonly used instruments were kept in one fish kettle sterilizer and the standard instruments in the other. The operating tables ran parallel with the main table; one was a standard adjustable portable table with lithotomy stirrups, which were used only once. For convenience, as a rule the patient was kept on the stretcher, which was placed directly on the table. The other operating table consisted simply of four forked sticks set at a convenient height in the ground and the stretcher handles were placed in the forks. This is really all that is necessary; an operating table is not an essential, but a convenience. Small tables made out of packing cases were provided for the anaesthetists, and what was essential, a separate table was set up on which was kept the operating record and on which the field medical cards were written up. Stools were also made for the anaesthetist and for the records table.

The operating room assistant was responsible for seeing that stocks of all expendable stores were kept up to requirements in the theatre. He had to assist in all the more serious cases and also supervised the sterilization of instruments. The second orderly cleaned the instruments after they had been used and re-sterilized them, setting them out for the next case. He also had to see that anaesthetic materials were ready. The third orderly (the batman) cut the clothes off patients waiting for operation and if possible shaved the affected parts; he also endeavoured to locate all wounds. He was responsible for the passage of patients in a constant stream, working with the stretcher bearers provided by the field ambulance. All three shared the task of laundry, which was done if possible in a nearby river. The linen was then autoclaved for twenty minutes after being packed in labelled drums. By this means the supply of linen was kept up, though it meant constant work in the slack times. It is possible to do without an autoclave and boil the linen in kerosene tins, but an autoclave is a great asset. Heat was supplied by pressure burners or by the inevitable "Primus" stove, which gave yeoman service. Two copper drums were used to sterilize water, so that as far as possible there was always a supply of cool sterile water. "Pentothal", catgut, scissors, scalpels and syringes were kept in "Dettol", as spirit was in rather short supply.

As Ackland<sup>(1)</sup> has pointed out, if a surgeon is to keep working for periods of a week or so, eighteen hours at a stretch is the maximum time during which he can operate efficiently. For the attack at the end of November, during which the field ambulance served a two-brigade front, two surgical teams were working together, though because of sickness more than three surgeons were never available. However, the presence of two teams enabled a roster to be drawn up both for surgeons and for orderlies. The orderlies, three in each team, worked eight hours in the theatre and had eight hours off, but in that time they had to do the laundry work. The surgeons worked eight hours operating and then eight hours seeing the casualties as they came in and drawing up the operating list, as well as supervising post-operative care and selecting patients for evacuation. Then they had eight hours' rest. So that each surgeon could have one night in three to sleep, the order of these duties had to be changed every day; this meant that once in every three days each surgeon had one spell of thirty-two hours on duty; of this period, however, only sixteen hours were spent operating, and during the other time he could usually snatch some sleep.

The role of selecting the casualties for operation is to be regarded as equally important as that of the surgeon operating. A list must be made of the order in which casualties are to be sent to the operating theatre, and whilst the medical officer is in the middle of making

this list another "jeep" load of casualties may arrive, some needing urgent surgical intervention. In addition, patients in the resuscitation ward have to be watched, and the optimum time must be selected for their visit to the operating table. Decisions have also to be made as to whether some moribund battle casualties would justify the time spent in operating on them when many casualties are waiting who have good chances of recovery. The selection of casualties for evacuation is also important. During the early part of the Scarlet Beach campaign evacuation was possible only in small barges and involved a sea trip of about sixty miles. It was considered that these barges were likely to be subject to enemy action, so that it was inadvisable to send patients in plaster or Thomas splints who would not be able to swim. The decision as to evacuation of casualties suffering from head, chest or abdominal wounds presents another difficulty as these patients travel badly in the first week after operation.

When a convoy of wounded was brought in, the casualties after their admission to the hospital were examined by the surgeon. He allotted them, according to the severity of their injuries, to the surgical team or to the field ambulance. The light section of a casualty clearing station was for one period working alongside the surgical team. Casualties were sent to them by the field ambulance officer at the reception station, and they had their own organization. A list was then pinned up in the operating theatre and the first patient was brought in; the bearers immediately went for the next patient on the list. While the first patient was being dealt with the second was cleaned and shaved, so that a constant stream of patients was maintained. With good team work amongst the orderlies and bearers no time is wasted. Alterations are made in the list or fresh lists are pinned up as required. A good team will deal with twelve or more cases in eight hours, according to the severity and number of the wounds.

Resuscitation and post-operative treatment were in the hands of the field ambulance nursing orderlies. The surgeons supervised post-operative treatment, and the routine work and resuscitation were in charge of field ambulance medical officers. We were fortunate in the two landings to have working in the field ambulance operating theatre and resuscitation ward the team of orderlies mentioned by name in Major R. H. Formby's article on "The Treatment of Shock in the Field", and trained largely by him. Their work was excellent. The work of the orderlies of the other field ambulance and of the casualty clearing stations, both in the operating theatre and in the resuscitation ward, was also first class.

The importance of keeping neat and accurate records is obvious, especially to one who has worked in line of communication hospitals well forward. The size and site of a wound under a plaster splint, the removal of or failure to find a foreign body, the presence or absence of nervous or vascular lesions, are all important; negative findings are in many cases as helpful as positive findings. In the rush of a constant stream of patients the field medical card is apt to be lost. A routine procedure is essential, and we formed the habit of hanging the card in its envelope on the right hand handle of the stretcher by the patient's head. If a clerk is not available to take down a description of the wounds as they are examined and dealt with (and a clerk is of great assistance), then the field medical card and the operation register must be completed by the surgeon himself immediately each particular case is finished. This is often no easy feat; the surgeon is longing for a cigarette, a cup of tea, a breath of fresh air or a salt tablet; he is dripping with perspiration which runs on to the card and mixes with the ink, and he is tired out; but adequate records are essential. It is here that a good batman is worth his weight in gold; he will see that "smokes", tea and salt are ready.

During the months of September, October and November the surgical team dealt with about 400 casualties. This is not a large number compared with 1914-1918 standards, but it is enough to cause some very busy periods. The greatest number of casualties operated on in the main dressing station in twenty-four hours was 50 by the surgical team

and the field ambulance surgeons; many of these casualties were suffering from minor wounds.

In this series of 400 casualties there were 26 wounds of the abdominal cavity, involving either a solid or hollow viscus or the mesentery. In many cases the lesions were multiple. Four of these patients with abdominal wounds died in the main dressing station before they reached the operating table. Sixteen soldiers with penetrating chest wounds were operated on; there were several more whose sucking wounds had been sutured at forward posts. In 16 cases penetrating wounds of the skull had been sustained; 10 patients had sustained fractures of the femur, 22 fractures of the tibia and 13 fractures of the humerus. It can be seen that approximately one-third of the casualties dealt with had some serious complication of their wound.

The standard routine of treatment of wounds was adopted—cleansing of the wounds with iodine or "Dettol" after shaving, excision of the wounds, treatment of complications, and dressing. Foreign bodies if palpated were removed, but no extensive search was made; there was no X-ray apparatus. To dress wounds after operation, shell dressings were found by experience to be the most convenient; they were also used for padding the rings of Thomas splints. Non-padded plaster splints were used for all fractures of the extremities, with the exception of fractures of the femur. Sulphanilamide powder was used in all cases; penicillin was not then available.

For operations on minor wounds, gloves were not worn, as they became full of perspiration and the skin of the surgeon's hands became very wrinkled if gloves were worn for long periods. The usual working dress consisted of long trousers, gaiters, and boots, a waterproof apron, and cap and mask, which were worn for all operations. Gowns were used only for operations on abdominal wounds, head wounds and fractured femurs. For these major operations sterile sheets and towels were used; for minor wounds squares of waterproof sheeting were used which were soaked in "Dettol" between cases. This saved a considerable amount of laundering.

Wounds were of all types; a larger proportion were caused by small arms fire than in the Middle East. The commonest sites for wounds were the arms and legs; nearly 75% of casualties were wounded either in the arm or leg, or in both. There were several sword wounds, and one batch of victims of a bombing attack were suffering from phosphorus burns; the fragments of phosphorus could be seen smoking on the wounds; these patients suffered from severe shock, and two died shortly after admission to hospital. There were very few self-inflicted wounds.

Some points of clinical interest arose in this series of cases.

#### Head Wounds.

Head wounds were treated conservatively; bone was nibbled away to expose intact dura and the wound was syringed out, but no effort was made to explore the track of the missile if it was deep. A plaster of Paris skull cap was made and left on. Patients with penetrating skull wounds were not moved for some days. Our experience bears out the view expressed by Ackland<sup>(1)</sup> that a patient completely unconscious from a penetrating head wound is not worth operating on if other casualties are waiting. No patient with a penetrating head wound who was deeply unconscious on arrival at the main dressing station lived long enough to be evacuated.

#### Chest Wounds.

If patients suffering from penetrating chest wounds survived the first few hours, they did well. An instruction was issued by the senior medical officer in the area to all regimental medical officers that all chest wounds were to be sutured immediately, whether they were sucking wounds or not. Before this order was issued, several sucking chest wounds had been left unsutured, as they were sucking only when the position of the patient was altered. After one fatal case of a pressure pneumothorax, when it took some time to prepare an aspirating syringe, a sterile 20 cubic centimetre "Record" syringe and aspirating needle were

always kept in the resuscitation tent. Immediate use of this apparatus on two casualties admitted with extreme dyspnoea produced dramatic improvement and was a life-saving measure. As a rule, sutures inserted by forward medical officers were left in for three days and the chest was kept empty by repeated aspiration.

When the main dressing station was under direct fire at Scarlet Beach, one patient who was suffering from a penetrating wound of both lungs received the day before walked over a mile to the beach without permanent ill effects; he did not want to be carried. Patients with penetrating chest wounds to be evacuated by air were flown round the coast to Port Moresby, and not over the Owen Stanley Range route with its high altitude.

#### Abdominal Wounds.

For abdominal wounds the principles laid down by Giblin<sup>(2)</sup> were followed as far as possible. Compared with his figures, results were disappointing; malaria and climatic conditions may have accounted for this fact. It was found that the standard weighted Ryle's tube used for continuous gastric suction was unsatisfactory, as its apertures become blocked frequently. Tubes made from small-bore rubber tubing with holes cut in the end proved more satisfactory. If it was suspected that an abdominal wound involved a hollow viscus, a gastric tube was always passed before the induction of anaesthesia was started. It is much easier to pass a tube then than when the patient is recovering from the anaesthesia. All casualties with penetrating abdominal wounds were given ten grains of quinine intravenously twice a day for two days after operation; even so, three of these patients developed malaria. Quinine was given as a routine measure to all severely wounded casualties. It was thought that if a diagnosis could with certainty be made of a small liver perforation only with no other abdominal injury, the patient was better off without operation.

One patient with a small liver perforation and a hole through his transverse mesocolon had a foreign body lying on, but not perforating, his portal vein. He died suddenly two days after operation. An autopsy was unfortunately not possible; but it was suspected that a portal thrombosis had developed.

#### Wounds Involving Long Bones.

##### Humerus.

Wounds involving the humerus were treated with a plaster splint reaching from the shoulder cap to the wrist, the elbow being flexed beyond a right angle. The arm was then fixed to the body with circular plaster bandages. This was better than attempting to apply an abduction spica, which made transport difficult. Casualties who had sustained compound fractures of the humerus did not travel so comfortably as those suffering from a fracture of the femur.

##### Femur.

In wounds involving the femur, the limb was always immobilized in a Thomas splint with fixed strapping extension. These patients travelled well. It was considered inadvisable and unnecessary to use skeletal traction.

##### Tibia and Fibula.

Wounds involving the tibia and fibula provided some of the biggest problems. Wounds of the calf from shell or bomb fragments usually produced extensive muscle damage. When the patient was suffering from shock, the presence of pulsation in the anterior and posterior tibial arteries at the ankle was often hard to determine. The decision as to amputation was difficult; but it appeared worth while to delay this decision in some cases until a thorough débridement had been made.

One patient was left with only his fibula, posterior tibial vessels and nerve, peroneal muscles and part of his *tendo Achillis* intact; a gap two inches long was left in the other structures of the leg. Subsequently it was learnt that the fracture united, and he is now able to walk on the leg.

Fractures of the bones of the leg were always treated in a closed plaster splint. Such casualties were not evacuated for forty-eight hours after operation. Only once was it considered necessary to split the plaster splint.

#### Wounds of Blood Vessels.

In four cases the brachial artery was severed; in three of these cases a good circulation developed in the hand in a short time. (One patient, indeed, an American officer, had pulsation in his radial artery at the wrist before operation.) The fourth patient died twenty-four hours after operation from a pulmonary embolus, proved at autopsy.

In two cases the hypogastric artery was ligated, once for uncontrollable bleeding from a wound passing through the pelvic wall and bladder, and once for severe hæmorrhage when a small deeply penetrating wound in the buttock was examined. In both cases the hæmorrhage was controlled and no complications followed.

Two wounds of the femoral artery were seen. One of these was in Hunter's canal, and a satisfactory circulation developed after ligation.

In the other case a bullet passing upwards into the pelvis from the groin had caused an arterio-venous aneurysm in the upper part of Scarpa's triangle. The external iliac artery was tied above Poupart's ligament and below the aneurysm, but hæmorrhage from the femoral vein could be controlled only by packing. The patient died next day. At autopsy a large retroperitoneal hæmatoma in the pelvis was found without visceral injury. There was a double femoral vein, and the wall of one of these branches had been split down to the intima for a length of four inches below Poupart's ligament.

#### Gas Gangrene.

In the series of cases dealt with only two instances of gas gangrene infection occurred, though other surgeons in the area saw several cases. One patient with a large wound in the buttock involving the lowest part of the rectum died from a fulminating gas infection twenty-four hours after operation. He had received at operation 16,500 units of polyvalent gas-gangrene antiserum. Another patient developed a gas infection in the leg twenty-four hours after treatment of a small penetrating wound in the calf, which obviously had not been excised widely enough. Amputation was performed below the knee joint, and the patient had an uneventful convalescence. Gas-gangrene antiserum was given as a prophylactic measure in all cases of large wounds or of wounds associated with extensive muscle damage.

#### Anæsthesia.

"Pentothal Sodium" as an anæsthetic agent was used more and more as the campaign progressed, and eventually was used in nearly every case. For patients suffering from abdominal wounds this anæsthetic agent, given into the intravenous therapy apparatus, was quite satisfactory. Never were more than two grammes needed; the effect lasted for over an hour and a half if the drug was given properly. These patients were given 0.25 grain of morphine intravenously about a quarter of an hour before the start of induction of anæsthesia. At times, when there was a slight shortage of sterile distilled water in ampoules, one gramme of "Pentothal" was dissolved in ten cubic centimetres of water instead of the usual twenty cubic centimetres and used with satisfactory results. It is a great help, if a rush of casualties is expected, to mix beforehand in a sterile bowl sufficient "Pentothal" solution for several operations. At one stage another preparation was supplied instead of "Pentothal"; it was unreliable.

The team started off with twenty pounds of ether in pound bottles. This was more than was needed, and the bottles are difficult to pack safely. It was found that ten pounds of ether in bottles packed securely weighed nearly fifty pounds. Any ether carried should be in tins. Spinal anæsthetic agents were not carried; they were not missed. Local anæsthesia was used only occasionally, except for aspirations.

Great assistance in the administration of anæsthetic agents can be given by the dentist attached to a field ambulance. If possible, opportunity should be made during quiescent periods to train dentists in the administration of "Pentothal". During an action the dental unit has little to do in its own line of work, and at times like this the services of medical officers at a field ambulance are at a premium, though great help in all directions was given by regimental medical officers of artillery and engineering units.

#### Resuscitation.

Stored blood was not available in the early part of the campaign, but as the position became stabilized it was sent up in plentiful quantities. Wet serum was always plentiful, and because of its constant readiness was used in all cases in which immediate resuscitation was necessary. At Scarlet Beach four members of a nearby artillery unit (blood group O (IV)) lived at the dressing station, so that a donor was always available; as one was used, he returned to his unit and was replaced. Quinine was given to all recipients of blood from this source. During the attack on Sateberg, when most casualties used to arrive about dusk, blood up to twelve litres was collected from troops at the base and kept in a refrigerator for use during the night. This measure proved well worth while. Stored blood was also available. No record was kept of the transfusion reactions, but none was severe. Mild rigors occurred during the administration of fresh blood, stored blood, serum and glucose and saline solution, so the fault was possibly in the technique used in cleaning the giving sets, though the standard technique was used. Formby<sup>(1)</sup> also blamed this factor for febrile reactions. Some patients, as pointed out by Formby,<sup>(2)</sup> reached a state of anoxæmia due to blood loss when irreparable damage had been done to the vital centres, and even if these patients did respond to resuscitation, the response was only temporary.

It is realized that nothing new has been recorded in this description of the experiences of a surgical team. It is written mainly as an account of some of the difficulties met with and of the attempts that were made to overcome them.

#### Acknowledgements.

It is essential that a surgical team lives up to its name and works as a team; the writer was fortunate in the team spirit shown by members of his unit, and in the help given to him by Colonel B. S. Hanson, D.S.O., O.B.E., the divisional Assistant Director of Medical Services. He was fortunate also in the cooperation shown by the commanding officers, officers and other ranks of the medical units with which he was associated. This cooperation demonstrated the excellent *esprit de corps* of the Australian Army Medical Corps.

Grateful acknowledgement is made to those surgeons<sup>(1)(2)(3)</sup> who recorded their experiences while in command of surgical teams in previous campaigns in this war. It is the help obtained from these published records that has prompted the writing of this article.

Major-General S. R. Burston, C.B., C.B.E., D.S.O., V.D., Director-General of Medical Services, has kindly given permission for publication.

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# DAGMAR BERNE: THE FIRST WOMAN STUDENT IN THE MEDICAL SCHOOL OF THE UNIVERSITY OF SYDNEY.

By R. SCOT SKIRVING,  
*Sydney.*

I CAN well believe, say, in 1884, or a little earlier, when there probably will be various interesting functions in commemoration of the first century of the School of Medicine in Sydney, that some meticulous medico, after memorials of its inception, may think it proper to inquire into the first appearance of women students in medicine.

It is then quite likely that some such parochial historian may wonder what manner of girl first broke the trail for femininity into the profession of medicine in New South Wales. I thought, therefore, that I might, now and here, contribute a little footnote to history, by telling what I remember about this first entrant to our profession.

Her name was, I understand, Georgina Dagmar Berne, but always was she known as simply Dagmar Berne. She was the daughter of Mr. Frederick Scoffwood Berne—a Dane of good stock. Her mother was a Tasmanian.

Dagmar was born in November, 1866. At first her intention, after leaving school, was to become a teacher, but ultimately she determined to tackle medicine with its formidable vista of years of study. A truly unaccompanied way at that time for a young girl, for she matriculated here when just about eighteen.

I am indebted to the Registrar of the University, and to Mr. Steel and Miss Stanley of the library staff, for the main facts of Dagmar Berne's studentship in Sydney. For the more personal parts of this paper, I owe much to Dagmar's younger sister, Mrs. Buswell. I have also to thank Dr. Cecil Purser, who, indeed, was of Dagmar's year, for various details of what work she actually did in Sydney. He described her as a kindly, modest, unassuming girl, with plenty of intelligence and no small industry. In these judgements I very fully agree, for I saw her often, both before and after she went to Britain to finish her studies.

In the University Calendar of 1884 she is listed as a first year undergraduate in arts. She did not complete her arts course, for she is shown in 1885 as a second year medical student, and this settles the point that she was the first woman to enter the faculty of medicine.

Dr. Purser kindly sent me a group photograph of his year—the third vintage of Sydney undergraduates, in their second year, in which Dagmar Berne is the only woman. From Mrs. Buswell I obtained the actual photograph of her sister as a freshwoman, aged about eighteen, which is shown here. There is, indeed, another group taken somewhere about this date of the students of medicine of several years with some of their teachers, which again also shows only one lone woman—Dagmar Berne.

In 1886 she is still recorded as in her second year, and in 1887 and 1888 she is again put down as a third and fourth year student. Her name does not appear again in any subsequent University Calendar. I infer that either she did not sit or failed to keep pace with the ordinary sequence of professional examinations. She therefore never became a graduate of the Sydney School of Medicine. I wish that it had been otherwise.

Actually the first women who did graduate were Iza F. Coghlan and Grace T. Robinson, in 1893.

I know that Dagmar did quite creditably in the earlier subjects, such as physics, chemistry, botany and zoology, and also in junior and practical anatomy. Apparently she somehow got tied up in the subjects of the second professional examination.

I gather from her relatives and other sources that the powers that were, were not violently encouraging to her, and she doubted if further perseverance in Sydney would lead to success. So, partly of her own initiative, and partly from the kindly encouragement of Mrs. Garrett Anderson, herself one of the first pioneers among women seeking a medical career, she determined to go afar and see if she could do better in some British school.

Perhaps she suffered somewhat from an inferiority complex, and needed a little judiciously applied heartening up, which I am afraid she did not get. Anyhow, to London she went. I do not know in what schools she studied, but I do know that she certainly received the latter parts of her education there, and also in Edinburgh and Dublin. I am also ignorant of what allowance was given her by her examining bodies for the work she had done here and examinations passed. I feel certain that a good deal in that matter was allowed. It is certain that she qualified in 1893.

In 1894 she is entered and described in the "London Medical Directory" as resident in the North-eastern Fever Hospital in Tottenham—presumably as a resident medical



officer. One is really left in ignorance of the details of her English experiences. She certainly held some resident posts, and one thing pleases me to know that she received kindness and help from both Mrs. Garrett Anderson and Mrs. Scharlieb, another famous woman doctor. With the latter, indeed, she did some professional work before she finally returned to Australia.

Mrs. Garrett Anderson was no ordinary woman; she was a real pioneer and a real doctor. She was the wife of Alan Anderson, a well-known London ship-owner, and came out to Sydney for about a year with her husband. I met her several times, and was much impressed by her wisdom and ability.

Regarding the diplomas Dagmar Berne obtained, I find that she registered in England and that her qualifications were as follows: Licentiate of the Royal College of Physicians and Surgeons of Edinburgh, 1893; Licentiate of the Faculty of Physicians and Surgeons of Glasgow, 1893; and Licentiate of the Society of Apothecaries, London, 1893. These same qualifications she registered in Sydney on January 9, 1895. That interval I take it she spent in resident posts and in post-graduate study.

Another Miss Berne, Dagmar's sister Florence, also started medicine, and possibly matriculated both in Sydney and London, for she, too, went to England, but the bank crisis fell upon us and the financial question was sufficiently acute to prevent her continuing her medical studies in London. So she found it needful to take a job.

I fear both these two young girls had a thin time till things in Australia mended. I remember about that date, passing through the big railway station in York on my way to Scotland, and my surprise and pleasure in seeing

so many difficulties which the present-day woman undergraduate knows not at all.

I am curiously ignorant of what she did do and attain in Sydney in her practice in Macquarie Street. It is certain, however, that she did make a very fair beginning and with the promise of a sufficient success. Moreover, she was, I think, without any other qualified woman to share what crumbs or stockpots of practice were not swallowed by the already increasing numbers of young male medical aspirants.



HINDER BANCROFT THIRLOW NEILL MILLS LISTER TRINDALL SHAW WHITE HESTER MOLAN  
ARMSTRONG MORTON  
SHEPHERD MACKENZIE DAVIDSON MACKAY PURCELL HUNT MACDONNELL MORTON  
BINNEY DICK TOWNLEY MISS BERNE RUTLEDGE MILLARD WILSON KELLY  
DR. BLAXLAND DR. JENKINS PROF. STUART SIR ALFRED ROBERTS DR. GRAHAM DR. MACALISTER DR. WILSON

Dagmar Berne on the platform; she looked worn and rather frail, but perfectly brave and determined to attain the objects for which she had left home comfort and security. I saw her for about ten minutes, and never met her again till she returned to Sydney and began to practise here. From the date of this chance meeting I think it must have been about or very near the time of her qualifying.

For myself I have her in quite clear remembrance, for I had in fact various professional dealings with her family and had many opportunities of knowing her.

She struck me then, indeed, always, as she did to all who knew her, as a quiet, friendly, sensible girl—and no fool. Perhaps, indeed, more likely to shine in a home than to battle as a pioneer woman in the arduous pursuit of a medical career. I think some of us (who were also in our own ways concerned in the making of our school) regretted that she should have to plough her solitary furrow with

I may say then, clearly, that she did arrive. She became a doctor and quite a good practitioner. And so I hold her in no small honour for her courage in overcoming many obstacles not small both material and spiritual.

She never married. If she had, I do not doubt that she would have fitted into the domestic life with suitability and success, for she had a just proportion of a Mary-mind and a Martha-hand to do it well. I gather from private sources that she had at any rate the opportunity of making in England a good and suitable match with a young doctor, already in the stirrups, and likely to rise high, but he could not abandon his career at home, and Dagmar Berne felt it her duty to return to her mother in New South Wales. So they parted, I hope, "with expressions of mutual esteem", and perhaps, who knows, a sore heartache.

Medicine is a mistress that most times allows of no divided affection, and so that romance ended, one may say, "by crisis".

How often this question of marriage with young medical people must be a difficult matter. If you wed too early an insistent spate of butcher's bills and babies may well cause you to keep your nose on the bread and butter line, and you are unable to find time or money for higher degrees and post-graduate study, and, alas, your ambition becomes choked in the dust of daily practice.

If, on the other hand, you keep your affections in cold storage, you may perchance keep them there too long, and so crystallize into an old bachelor, crusty perhaps, or a little self-indulgent, or become an industrious virgin with a slightly sub-acid outlook on life. From these states it is just as difficult to become malleable and collaborative again, as it would be to unscramble an egg once it has taken that disparted shape upon itself.

I fear Dagmar Berne never had robust health after these struggles in England. I am told that at one of her examinations there she actually rose from her bed with an active pleurisy present, which I take probably to have been the advance signal of the malady of which she ultimately died.

Well, I must make an end.

She put up her plate in Macquarie Street in 1895, but after some years in practice in Sydney indubitable signs of lung trouble developed. She went to the Blue Mountains without improvement, and then went to Trundle, where the tuberculous condition did not obsolesce, for the end came with florid hæmorrhages. She died on August 27, 1900, aged thirty-four.

Her sun set indeed out of due season, yet I do not think her life's work was frustrate. She succeeded "after long days of labour" and many handicaps in doing what she set out to do, not brilliantly, perhaps, but memorably, and as an example of sustained effort, admirable. She was thus a trail-breaker, and she justly provoked the respect and friendship of those who were either her fellow students or her teachers. I fear there are but few of either alive today.

By the pious act of her mother, her memory, in the University of Sydney, is perpetuated by the foundation of the "Dagmar Berne Scholarship", to be awarded to the woman medical graduate who takes the highest marks of her year in the final examination for the M.B. degree.

## Reviews.

### "THE DIABETIC LIFE."

LAWRENCE'S "Diabetic Life" has become a British medical institution as inevitable and as necessary in medical literature as the Oxford Dictionary is to the general reader.<sup>1</sup>

<sup>1</sup> "The Diabetic Life: Its Control by Diet and Insulin: A Concise Practical Manual for Practitioners and Patients", by R. D. Lawrence, M.A., M.D., F.R.C.P. (London): Thirteenth Edition, with Wartime Supplement; 1944. London: J. and A. Churchill, Limited. 8" x 5½", pp. 250, with illustrations. Price: 10s. 6d.

Thirteen editions in twenty years must constitute a record of its own kind. While the rapid growth of knowledge and methods of management subsequent to the discovery of insulin and of its more recent modifications must have provided the need for frequent revision, the main reason is probably that the demand has always exceeded the publisher's expectations. Dr. Lawrence has always been able to produce so many more facts that a new edition rather than a reprinting has followed.

These additions and alterations are usually from his own research and experience, and all new knowledge quoted is accompanied by criticism based on his own shrewd observations. The latest edition, the thirteenth, has been entirely rewritten, and much of the reference to diabetic practice before and just after the advent of the insulin era has been discarded. In his preface he states that his main object has been to produce a practical guide to treatment, and theory is kept to a minimum. The work as it now stands is so complete and succinct that it provides an answer to every diabetic problem, whether posed by the physician or the patient. Each diabetic must become his own doctor to a large degree, so that the book is still in a form able to be compre-

hended by an intelligent diabetic. With each edition, however, the contents have become of more value to the doctor, and in parts too technical for the average patient. None the less it is the best available text-book for what one may term the diabetic graduate, but diabetics of the hospital class require something simpler and cheaper.

This edition still carries special advice to diabetics in war-stricken England, where the Diabetic Association, headed by Dr. Lawrence, has, by representation to the food authorities, made excellent provision for the diabetic's ration. Dr. Lawrence now treats all newcomers into the diabetic fraternity by zinc protamine insulin unless there are special contraindications. After eight years' experience with this compound he feels that it controls ketosis better than two injections of soluble insulin. He does not advocate the transfer to insoluble insulin of a patient under satisfactory control and well versed in the use of soluble insulin. He disapproves of the giving of two separate injections when insoluble and soluble insulin are used together, but recommends that they should be mixed in the same syringe, the soluble insulin being taken up first. He points out that when approximately equal amounts of the two insulins are thus mixed, about half the soluble insulin becomes immediately adsorbed to the protamine compound, and after injection, behaves accordingly. He makes little mention of globin insulin (with zinc) beyond stating that in his experience it has no virtues over those of zinc protamine suspension. Emphasis is also laid upon the importance of emptying the bladder half an hour before again passing urine to be tested as being the only guide to the time of maximum or minimum insulin effect. His conclusion that the appearance of glycosuria once or twice daily is preferable to a constant dread of potential or actual hypoglycæmic attacks will be echoed by all diabetics.

Included in this edition for the first time is a summary of the nature of hyperinsulinism both from pancreatic and extrapancreatic causes, and his conclusions on the management of the pregnant diabetic, based on his contribution with W. Oakley to *The Quarterly Journal of Medicine*, are included. He advises abortion for the careless, and Cæsarean section for the careful at the thirty-seventh week. Lawrence regards the inheritance of diabetes as a Mendelian recessive trait as still unproven, in spite of the statistics concerning identical diabetic twins and the favourable mathematical



formule collected in America on this question. In the section on the management of diabetic children, the excellent results with zinc protamine insulin are advertised. A brief reference is made to the newer conception of ketone metabolism, but the book is essentially practical rather than theoretical. On every page the author is able to draw upon his own unique experience and to give emphatic advice which is beyond criticism. This fact alone distinguishes "The Diabetic Life" from most other medical monographs, and has resulted in a curious but significant lack of competitors in this field of British medical literature. Possession of a copy of "The Diabetic Life" is almost as indispensable as a telephone directory to every student, physician or clinic worker.

#### REHABILITATION AND PHYSICAL THERAPY.

MUCH time and thought are being given at present to the study of methods by which those incapacitated through illness or accident will be more fully and more quickly reestablished in society. "Rehabilitation, Re-Education and Remedial Exercises", by Mrs. Olive F. Guthrie Smith, is a valuable contribution to this study.<sup>1</sup> In this book the author describes in detail the methods used at Saint Mary's Hospital, London, in the physical exercise department of which she is director. She stresses the importance of a combination of psychological, physiological and mechanical principles, and that they require a definite technique. Active and volitional, as opposed to passive, movements are urged wherever possible. To assist in this teaching the author uses a suspension apparatus consisting of a collection of springs and pulleys which strives to eliminate gravity, and the book gives the first full and authoritative account of exercises designed by her for use with this apparatus. Lord Horder, in a foreword to the book, comments on this modern development of physiotherapy.

Some idea of the scope covered may be gathered when it is seen that the rehabilitation of patients in the fracture clinic, the chest unit and the maternity unit, as well as in the wards and the out-patient department, all receive attention.

The value of the book is increased by a number of well-written articles on special problems contributed by authors distinguished in their particular subjects. The book is well set up and the many illustrations are good. It can be recommended not only to those who are interested in the practice of physiotherapy, but also to the physicians and surgeons who refer their patients to them.

#### "STRUCTURE AND FUNCTION AS SEEN IN THE FOOT."

PROFESSOR WOOD JONES is already known to readers as a brilliant comparative anatomist and especially as the author of "The Principles of Anatomy as Seen in the Hand", in which the basic principles governing the structure of the body are so clearly presented. The book now under review is easily the best of those devoted to the anatomy of the foot, and is a worthy companion to the volume on the hand.<sup>2</sup> The introductory chapters contain a welcome reference to the principles of terminology, then follow sections on the phylogeny and ontogeny of the foot, while the greater part of the text is devoted to the various anatomical elements of which the foot is composed. The emphasis throughout is on essentials, and where possible the author deals not only with structure, but also with function; he aims to provide the reader with a knowledge of the foot as an active working machine, and in this succeeds admirably. The descriptions are distinguished by the same lucidity that made the sister volume so popular, while the author's

views are, as usual, interestingly developed and delightfully expressed. The line illustrations are a feature of the text—they are well chosen and beautifully executed.

The "Principles of Anatomy as Seen in the Hand" and "Structure and Function as Seen in the Foot" are two of the most noteworthy contributions to anatomical literature—there are certainly no other volumes that can be so strongly recommended to the student who wishes to gain an intelligent and useful idea of the structure of the body.

#### "TREATMENT READY TO HAND."

It is not surprising that a fourth edition of such a useful little book as "Vade Mecum of Medical Treatment" by Dr. W. Gordon Sears has been called for within the short space of twelve months.<sup>3</sup> As one might expect, there is practically no variation in the original form of the book, although quite a number of minor alterations have been made, and the sections on impetigo, scabies and pertussis have been largely rewritten. The alphabetical arrangement of the sections makes it an easy matter to refer quickly to any subject on which information is required, and the reader can always rely upon a sane, common-sense answer to his inquiry on the question of treatment.

There is little room for criticism in such a carefully compiled handbook. However, a word might be said about the treatment for tape-worm infestation on page 347. To overcome the nauseating taste of the liquid extract of male fern it might be more merciful to give it to the patient in six gelatine capsules each containing fifteen minims of the drug rather than in a mixture. Furthermore, it is questionable whether the single dose of ninety minims is sufficient to expel the entire worm; some authorities recommend that a further ninety minims be given one hour later.

At the end of the book the reader will find much useful information on the sulphonamides, a brief reference to penicillin, a posological table, weights and measures, together with many other facts and figures which may be wanted at short notice.

Once again this small book can be safely recommended to senior students and medical practitioners.

#### GYNÆCOLOGY FOR THE GENERAL PRACTITIONER.

WHILE there are many excellent text-books on gynaecology, the general practitioner rarely has the time for their systematic study, nor do they always help him in the elucidation of a particular problem. Dr. M. Moore White has written a book entitled "The Symptomatic Diagnosis and Treatment of Gynaecological Disorders", which gives an excellent account of the common symptoms and their treatment.<sup>4</sup> The book is divided into chapters, each dealing with a particular complaint—pain, backache, leucorrhœa, functional menstrual disturbances, sterility *et cetera*. Very briefly but concisely these are described, and the appropriate treatment is outlined in a way which can be carried out in the consulting room. Emphasis is laid on the cases which should be transferred to a specialist. The chapters on dysmenorrhœa and sterility are particularly good. In addition there are sections on distressing antenatal symptoms, contraception and radiation therapy. As many practitioners have to manage the after-care of their patients, there is an excellent chapter on pre-operative and post-operative treatment and their complications.

This is a text-book of a new type obviously the result of wide clinical experience and will be found of value by all who have to deal with the varied and often obscure complaints presented by many female patients.

<sup>1</sup> "Rehabilitation, Re-Education and Remedial Exercises", by Olive F. Guthrie Smith, M.B.E., C.S.M.M.G., T.M.G., with a foreword by Lord Horder, G.C.V.O., M.D., F.R.C.P.: 1943. London: Baillière, Tindall and Cox. 8" x 6½", pp. 432, with 268 illustrations. Price: 25s.

<sup>2</sup> "Structure and Function as Seen in the Foot", by Frederic Wood Jones, D.Sc., F.R.S., F.R.C.S.: 1944. London: Baillière, Tindall and Cox. 8½" x 5½", pp. 333, with illustrations. Price: 25s.

<sup>3</sup> "Vade Mecum of Medical Treatment", by W. Gordon Sears, M.D. (London), M.R.C.P. (London): Fourth Edition, 1943. London: Edward Arnold and Company. 7" x 4½", pp. 396. Price: 10s. 6d. net.

<sup>4</sup> "The Symptomatic Diagnosis and Treatment of Gynaecological Disorders", by Margaret Moore White, M.D. (London), F.R.C.S. (England), M.R.C.O.G., with a Foreword by F. J. Browne, M.D. (Aberdeen), D.Sc., F.R.C.S. (Edinburgh), F.R.C.O.G.: 1944. London: H. K. Lewis and Company, Limited. 8½" x 5½", pp. 239, with many illustrations. Price: 16s. net.

## The Medical Journal of Australia

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### OVER-CROWDING AT AUSTRALIAN UNIVERSITIES.

PEOPLE of every generation have probably said at one time or another that "things are not what they were". The remark generally implies regret and comes from those who are not so young—if only conditions had not changed the world would be a happier place, at least for the one person. But the "good old days" were often "bad old days", and he who longs for them is most likely one who has stood still or has kept his eyes shut while the world around him has gone ahead. On the other hand, even those who move with the times know that what is new is not always good any more than the old was always bad. With social progress—or shall we say, with social change, because change is not necessarily a sign of progress—inequalities and difficulties are bound to arise. Adjustments may have to be made, and in the making of them wisdom must be shown and a sense of proportion preserved. Granted a willingness to make these adjustments, conservatism may have to be overcome on the one hand and impetuosity curbed on the other. One sphere of activity in which new developments are continually taking place, and in which, owing to the constant growth of knowledge, change will always be needed, is that of education. This is specially true of medical education, a subject in which doctors of every vintage must always take a lively interest. At the present time medical education is not alone in the complicating factors that have been introduced by the present war.

Before reference is made to the special aspect of medical education that we wish to discuss, it will be useful to refer shortly to the qualities that should be inherent in the student of medicine, his teacher and his university. These qualities should be found in students, teachers and universities of every age and of every country. They will be as indispensable in fifty years' time as they are now and as they were fifty years ago when they were described by William Osler, a giant among teachers of medicine, in the addresses published in his well-known book

"Æquanimitas". In speaking of the teacher of medicine, Osler said that his function (he paraphrased the words of Matthew Arnold) was to teach and to propagate the best that was known and taught in the world. He explained teaching with the words sifting, analysing, assorting, and laying down principles. "Propagate" meant to him to multiply facts on which principles could be based—"experimenting, searching, testing". The teacher, he held, could be viewed from two aspects—as a worker and instructor in science and as a practitioner and professor of the art. The departments of a medical school should, he declared, be in the charge of men who were gifted in three respects—first, with enthusiasm, "that deep love of a subject, that desire to teach and extend it without which all instruction becomes cold and lifeless"; secondly, with a full personal knowledge of the branch taught, "not a second-hand information derived from books, but the living experience derived from experimental and practical work in the best laboratories"; and thirdly, with a sense of obligation, "that feeling which impels a teacher to be also a contributor, and to add to the stores from which he has so freely drawn". For the student of medicine Osler demanded four qualities; the first three were the "art of detachment", the "virtue of method" and the "quality of thoroughness". To these had to be added the "grace of humility" if permanence was to be given to the powers that the first three qualities might confer. Osler assigned two functions to a university—teaching and thinking. He wrote: "In teaching men what disease is, how it may be prevented, and how it may be cured, a University is fulfilling one of its very noblest functions." What he meant by the thinking function of a university was "that duty which the professorial corps owes to enlarge the boundaries of human knowledge". It was this kind of work which made a university great and enabled it to exercise a wide influence on the minds of men.

With these ideas as a background we may now turn to the subject of the present discussion, which is the enormous overcrowding found today in many of the Australian universities. Before the war the number of students was too great, but now, after five years of war, conditions are much worse. The reasons for the added numbers during the war years need not be discussed. It must be pointed out, however, that in view of the large numbers of members of the forces who on demobilization will seek admission to universities, there is little likelihood of any reduction in numbers for some years to come. In this regard attention may be directed to a letter on the university quota system by Dr. Cedric Swanton that was published in a recent issue of this journal. That the overcrowding is very real is shown by an article that appeared in *The Australian Journal of Science* of June, 1944. Dr. E. A. Briggs, assistant professor of zoology, and Dr. F. Lions, lecturer in chemistry, both of the University of Sydney, write on "Mass Production in Australian Universities". These authors state that for several years they have by ordinary lecture methods had to handle large first-year classes in zoology and organic chemistry, containing as many as 320 in a single class. At the present time one of them is "personally responsible for all the instruction, both theoretical and practical, to all the first- and second-year students of organic chemistry in the University of Sydney, amounting to over 700". One cannot help wondering what Osler would have thought of this state of affairs. The plight of the students is worse than

that of the lecturers. We read that it is almost impossible for students at the back of the lecture theatre even to see the test tubes used in a demonstration lecture experiment, let alone a colour change or a precipitate formation that has taken place, and students have actually been advised to use opera glasses and field glasses in an attempt to surmount the difficulty. Some students have followed this advice. We should imagine that all the students cannot hear the lecturer. The lectures of both these authors are attended by students of the faculty of medicine, but these are not the only examples of overcrowding to which medical students are subjected. As an example it may be stated that at the present time approximately 550 students are working in the dissecting room at the University of Sydney; the accommodation is really suitable for no more than 300. Sixteen students are allotted to each cadaver; but this is further complicated by a shortage of cadavers, a subject of the greatest importance which cannot be discussed at present.

The indictment of Dr. Briggs and Dr. Lions is serious, and everyone who has any thought for the welfare of the community must demand that its chief centre of learning shall fulfil its function and extend its sphere of usefulness. Medicine alone is not involved, though medical men and women will naturally think first of the abode where the practitioners of the future are to be trained and nurtured. Our authors state that university authorities are, "ostrich-like", trying to ignore the problem. Graduates must be the first to insist that the problem shall not be ignored. If nothing is done, all we can look forward to is a gradual decline of at least some of our university departments, with ultimate sterility. Osler insisted that one of the chief difficulties in the way of advanced work by university teachers was the stress of routine class and laboratory duties and that these often sapped the energies of men capable of higher things. It is a wonder that a man with the sole responsibility for the teaching of 700 students in such an arid subject as organic chemistry has enough energy left even to become joint author of an article seeking to remedy an impossible situation. As for students, they may have the enthusiasm, method and thoroughness spoken of by Osler, and even the humility as well, but they will be extraordinary people if they can retain these qualities in the face of the severe handicaps that have been mentioned. The present age is a materialistic age, and the premedical education of many students is already concerned over much with subjects likely to be "of use" in medicine, rather than with subjects that build up a logical and thoughtful mind. Difficulty of study within the university will only mean that more of the "useful" subjects will be put onto the school curriculum and aggravate an already unfavourable mental balance.

The remedy is not very easy to find. As already mentioned, it is unlikely that the number of students will be reduced. Some persons will ask whether Australia needs more universities, but most of those who have inquired into such a suggestion will be against the idea. The number of lecturers and assistant demonstrators can and should be increased. If the universities have not sufficient funds, then the State which sends students to universities must help to provide them with teaching. The number of lectures should be reduced to a minimum. The lecture which consisted of one hour's dictation by a droning

professor was one of the features of the "bad old days", and to the best of our knowledge is not now extant. The recitation of matter in the form, if not in the actual words, in which it appears in a standard text-book should not be tolerated. A spontaneous lecture can be illustrated by lantern slides or pictures thrown on the screen from an epidiascope and be intelligible to a relatively large audience. Two suggestions made by Dr. Briggs and Dr. Lions would be innovations for most universities, and though their adoption would cost a good deal of money, the advantages should be considerable. One is the installation of equipment to amplify the voice and the other is the extensive use of cinematograph films. The benefit that would follow the amplification of a lecturer's voice is obvious. The use of films enables a procedure to be shown over and over again until no doubt or uncertainty remains. Two examples of the medical film producer's art have recently been shown in Melbourne to small medical audiences. One is a film showing every detail of the operation of pneumonectomy with pre-operative preparation and post-operative treatment. The other is a film dealing with anoxia and making its mechanism clear. There is no doubt that in the future the universities will have to be prepared to spend money on medical films, and it might be possible for a start to have a central film library which could be drawn on by the four medical schools in the Commonwealth on a roster basis. The disadvantage of these measures is that personal contact between teacher and student is lost. This may be part of the price that we shall have to pay for efficiency in the future—one of the things of the "good old days" that we shall have to be prepared to forgo. If this is to be, it should be as a result of a considered and carefully elaborated scheme. We must not be allowed to drift, for therein lies disaster.

### Current Comment.

#### THE INCIDENCE OF CANCER OF THE LUNG.

THE question of the frequency of cancer of the lung has been much debated. Once thought to be rare and now known to be common, it has been recognized so much more frequently of recent years that an impression was gained that this disease was truly increasing in incidence. Paul E. Steiner reviews the problem of lung carcinoma with special reference to this point.<sup>1</sup> He remarks that mice and men share the doubtful distinction of being the only species known to be thus commonly afflicted. According to general hospital autopsy statistics, only carcinomata of the stomach and bowel usually exceed this pulmonary newgrowth in frequency. Steiner quotes some curiously contrasting figures, those of Adler, who in 1912 could discover only 372 cases in the literature, and those of Dorn, who estimates that in the United States of America over 8,000 new cases are diagnosed each year and about 13,000 patients are simultaneously under treatment. Mortality rates vary greatly in world statistics, as perhaps might be expected, but an average of the figures calculated in a number of centres shows that out of a grand total of 93,500 necropsies cancer of the lung was found in about 1%. The component figures from which these totals are made up show great variations, from 0.3% to 2.16%. Therefore, it is not surprising that there is much argument over the question of a possible absolute increase in this type of growth. There is no doubt that carcinoma of the lung has been more frequently seen of recent years. Whether the increase is apparent or real is not easy to

<sup>1</sup> Archives of Pathology, March, 1944.

determine, though authorities in a number of countries have thought it was real. In Australia Cotter Harvey, in a review of 100 cases published in 1936, held this view. A relative increase may be explained by more critical pathological diagnosis made in the light of the modern work on the differentiation of these tumours, and by more accurate clinical diagnosis, by use of more exact methods of examination, such as bronchoscopy and biopsy. Other factors tending to produce this relative increase are the greater numbers of patients attending thoracic clinics, and the increased survival age of the population from which the patients are drawn.

If the increase is real it would be hard to assign a reason. There are greater occupational hazards faced in certain callings, but these are not statistically significant in the case of lung carcinoma. Steiner points out that it is worth while to try to decide this question, because it is unlikely that any factors other than those of environment would be involved, hence some degree of prophylaxis would be theoretically conceivable. Steiner's own contribution to this debate is based on the extensive records of the department of pathology of the University of Chicago, which cover over forty years, and in which most of the histological diagnosis was made by one pathologist. Sections of all the specimens are still available, thus permitting recheck of the diagnosis. In his analysis Steiner deals with such factors as age, race, the sex ratio of autopsies, and the percentage of cases in which tumours of any kind were found. The general increase in lung carcinoma, estimated in five-year periods, is striking, but when controlled by comparison with increases in other forms of carcinoma, the increase does not appear to be excessive. In this series cancer of the lung was fifth in frequency among all types of tumour, and third among types of carcinoma. Steiner's opinion coincides with that of most pathologists, that there is no satisfactory evidence that there is a real increase in the incidence of primary carcinoma of the lung. This in no way alters our outlook on a neoplasm that is now known to be of great importance, and whose presence or suspected presence in the subjects of pulmonary lesions is by no means rare.

#### THE RESULTS OF TREATMENT FOR PERNICIOUS ANÆMIA.

It is perhaps hard for the medical students of today to realize that their senior teachers easily remember not only the time when an aeroplane in the sky was an unusual sight, but even when the motor-car was relatively uncommon also. Therefore, they accept placidly the stabilization of the diabetic and the patient with pernicious anæmia. In the latter case even the declared and untreated disease is no longer submitted to close study, for it is only untreated so long as it is unrecognized. Incidentally the curious remissions and exacerbations which were once so striking a feature of this condition are now seldom seen, and their real significance will possibly never be understood. But it is a sobering thought that of a series of eighty living patients with pernicious anæmia, in only 29 cases was the diagnosis made within a year of onset; in 21 the diagnosis was not made till a year had passed, in 14 till after two years, and in 10 till after three years. This series has been collected and analysed by M. Hardgrove, R. Yunc, H. Zotter and F. Murphy, using the special clinic of the Milwaukee County Hospital Dispensary.<sup>1</sup> It is at least cheering to read of such a good series illustrating survival in disease ultimately fatal if the appropriate treatment is not adopted. More than half these patients have been under treatment for over five years, and 14 of the 80 have been treated for over ten years, the maximum period in the series being 13 years.

Study of the patients and their case records has revealed some interesting information. The symptoms which should make a medical attendant suspicious of pernicious anæmia are of special interest. Sore tongue was a complaint of 40% of the patients at the onset, and 25% of them had some disturbance of gait, paræsthesiæ of the hands and

feet being slightly more common. It is not unusual to find that prior to the making of the correct diagnosis the patient has complained persistently of troublesome sensations in the hands or feet, and, since these are merely subjective phenomena, they do not always receive the careful attention they merit. Difficulty of micturition is also a fairly frequent symptom, and was observed in 32% of these cases. Anorexia was quite common, so, too, was some complaint of indigestion.

The aim of treatment was to maintain the red blood cell count above 4,500,000 per cubic millimetre, and, according to the *cliché* popular at the moment, the target aimed at was 5,000,000. In two-thirds of the cases three cubic centimetres of a crude liver extract were sufficient to attain this end when injected every four weeks, though some patients required an injection every three weeks. Of course, individual study was required, and dosage needed adjustment from time to time. This dosage was found sufficient to maintain a normal blood count and to prevent neural damage. That this latter risk is no mere academic consideration must be emphasized. In this series paræsthesiæ and disturbances of gait and of bladder function were found during the course of treatment in a certain proportion of cases, varying from 9% to 15% of the total, even though these features had not been present at the time of diagnosis. In other words, signs of neural damage occasionally appeared even during the administration of what was thought adequate treatment. Sensitivity to liver extract is a troublesome complication of treatment in certain cases. These authors found, as others have, that in most cases it tended to disappear, even as reactions to protamine zinc insulin, sometimes annoying or dismaying in the treatment of diabetes, tend to disappear. Nineteen of the patients neglected their treatment for varying periods, but even prolonged neglect fortunately did not unduly penalize them, for they once more responded well on resumption of therapy. This series is of interest, not merely because it shows what hope can be offered to patients found to suffer from pernicious anæmia, but also because it points clearly to the need for watchfulness lest the disease be overlooked, as it easily may be.

#### ABSCESS OF THE LIVER.

THE repatriation of soldiers, sailors and airmen from tropical regions will be accompanied by an increase in the incidence of amœbiasis. The manifestation of this disease that is most to be dreaded and most apt to be overlooked is liver abscess. The diagnosis is not always easy. Wallace M. Yater describes a diagnostic method that he has employed over a period of twelve years or more in a large series of cases.<sup>1</sup> He gives an intravenous injection of 75 cubic centimetres of "Thorotrast" (a colloidal solution of thorium dioxide). This substance, which is radio-opaque, is taken up by the cells of the reticulo-endothelial system. The abscess, consisting of necrotic material and pus, does not take up the thorium dioxide, and so appears as a transradiant area in a skiagram. The only lesions likely to give rise to confusion in radiological diagnosis are neoplasms and cysts. Carcinomata and hydatid cysts appear as "areas of lesser opacity with clearcut margins and often with a halo of condensed liver tissue". The outline of a solitary abscess may or may not be sharp; but in neither case does it have a surrounding zone of increased density. Multiple pyogenic abscesses "are smaller and present a fuzzy outline that blends with the adjacent liver parenchyma". An advantage of this method is that the abscess can be accurately localized before operation is undertaken. In following up a series of 286 cases Yater has found no evidence of harmful effects from the use of thorium dioxide in the doses recommended by him. The method would appear to be of value, particularly in determining the site of the abscess. The most important single factor in diagnosis is to suspect the presence of an abscess in any case of fever accompanied by pain in the right hypochondrium.

<sup>1</sup> The Journal of the American Medical Association, July 15, 1944.

<sup>1</sup> Annals of Internal Medicine, May, 1944.

## Abstracts from Medical Literature.

### RADIOLOGY.

#### Traumatic Separation of the Upper Femoral Epiphysis.

**PUTNAM C. KENNEDY** (*American Journal of Roentgenology*, June, 1944) states that traumatic separation of the upper femoral epiphysis is a rare birth injury. Every case except one has occurred during podalic version and breech extraction or breech presentation and extraction. The upper femoral epiphysis at birth is a single cartilaginous mass, including head, neck and both trochanters. It is displaced medially and downward at its junction with the diaphysis. The periosteum is usually stripped up and sometimes ruptured. The joint capsule and *ligamentum teres* remain intact. The first Röntgenographic sign is displacement of the upper margin of the femoral diaphysis, always outward and usually always upward. This can be ascertained by comparison with the structures of the other side, and by noting the position of the proximal end of the shaft in relation to the Y-shaped fissure of the acetabulum. In a few severe cases the end of the shaft is seen above the upper limit of the Y-fissure, lateral to the lower portion of the ilium; but usually it lies below or at the level of the fissure. In most instances the diaphysis is externally rotated; it may be either abducted or adducted. Faint callus shadows can be discovered during the second week, though in one instance they were noted as early as the fifth day. After the first two weeks the callus is readily visible; it is usually abundant and forms a club-like mass around the proximal end of the diaphysis. At first it is flaky or cloudy, but later (fourth week and after) it becomes more compact, more dense and more heavily calcified. At about the same time as the callus appears, the characteristic sign of subperiosteal new bone formation, a result of the avulsion of the periosteum from the cortex, makes its appearance. This extends distally from the upper end of the shaft for variable distances, often below the mid-point, and occasionally to the lower end. As the callus becomes denser, so does the subperiosteal tissue. The upper limits of this periosteal reaction can often be seen, incorporated in the mass of callus. During the second and third months the callus and subperiosteal new bone undergo organization and absorption. The club-like mass becomes progressively smaller, its edges are smoother and its internal structure is trabeculated. Reconstruction and remodelling of the femoral neck and upper diaphysis are apparent in the Röntgenograms. Outward and sometimes upward displacement of the diaphysis may still be present, dependent on the severity of the injury and the subsequent treatment. Another characteristic sign is the premature ossification of the capital epiphysis on the injured side. At later examinations usually only widening of the proximal end of the diaphysis in the trochanteric region is seen; traces of the old callus and the remodelling process may still be present. Often a *coxa vara* deformity is present, with narrowing of the neck-shaft angle; the

upper third or fourth of the shaft may be bowed in a *varus* manner. In some instances—the least severe injuries—the bones appear normal.

#### Actinomycosis of the Vertebrae.

**MORTIMER LUBERT** (*American Journal of Roentgenology*, June, 1944) states that Röntgen examination may aid in the diagnosis of actinomycosis before the vertebrae are involved, especially when the lungs are the primary site. Involvement of the ribs and sternum, in association with parenchymal infiltration in the lungs, pleural thickening, and empyema, more strongly indicates actinomycosis than any other process. Examination of the ribs and sternum may reveal destruction with or without the reaction of osteomyelitis or periostitis about them. If sinuses are present, their connexion with the destroyed rib need not be demonstrated. When the vertebrae are involved, the Röntgen findings may be characteristic, if not pathognomonic. Erosion of all portions of the vertebrae and adjacent ribs, including the pedicles, spines, lamina and body, is a feature. The body is usually affected in its cortical portion, periostitis being an early manifestation finally leading to erosion. The anterior surface of the body may have a saw-tooth appearance. Reactive condensation takes place about destroyed areas and the vertebra involved may appear denser than its neighbours. The intervertebral disk is usually not involved. In no case is the uniform decalcification of one or more vertebrae found, as is sometimes observed in tuberculosis. Both tuberculosis and non-specific osteomyelitis may on rare occasions simulate the appearance of actinomycosis of the vertebrae. However, involvement of the intervertebral disk with narrowing of the intervertebral space and finally collapse of the bodies of the vertebrae is the most common type of tuberculous involvement. Any deviation from this picture makes the Röntgen diagnosis of tuberculosis difficult without supporting evidence from other sources. In non-specific osteomyelitis, biopsy and bacteriological examination must be resorted to if the rest of the clinical picture is not conclusive. Even then difficulties may remain, as actinomycosis may not be present in a small biopsy specimen, and a prolonged and repeated search will be necessary before organisms are demonstrated.

#### Acute Suppurative Arthritis of the Hip in Childhood.

**PETER E. RUSSO** (*American Journal of Roentgenology*, April, 1944) states that there are two types of acute suppurative arthritis of the hip in children. In the primary type the infection attacks the synovial or perisynovial structures, whereas in the secondary type the infection is primarily intraosseous in location, and owing to spread or extension of the bone infection, the joint is secondarily affected. There are several points of difference between the two types. The primary type is in most instances due to a streptococcal infection, the disease usually subsides within five weeks, and the affected hip in many cases regains its normal range of motion, with very little residual deformity of the hip, if any. On the other hand, the secondary type is usually caused by a staphylococcal infection and runs a long

course; draining sinuses take many months or years to heal, range of motion is in most cases much impaired, and ankylosis and deformities of the hip result in the majority of cases. In the primary type of suppurative arthritis of the hip, affecting chiefly the synovial or perisynovial tissues and destroying the articular cartilage, the infectious process in most instances can be arrested before any bone involvement develops. This, however, depends on the virulence of the pathogenic organism. If the infection can be brought under control within a short period of time, and has caused little or no bone destruction, the hip joint will regain its normal range of motion. The primary type is found in young children, aged under two years. Osteomyelitis of any of the bones of the pelvic girdle with extension into the hip joint is responsible for the secondary type of arthritis, which is by far the more frequent type. The hip joint differs in this respect from the other joints of the extremities, in that the epiphyseal line in these other joints usually limits the infection before extension into the joint occurs. It may well be that the anatomical characteristics of the vascular supply and lymph drainage of the hip are responsible for this difference in reaction to an infection. The branches of the nutrient arteries supplying the femoral neck are in early life end-arteries in the sense of Cohnheim; only later is anastomosis established. This undoubtedly must be of great significance in the presence of a pyogenic embolus in cases of blood-borne infections. In the secondary type, the articular cartilage is completely destroyed and the subcartilaginous bone eroded. This process invariably affects the adjoining bones, so that multiple bony involvement occurs and is responsible for the impaired motion of the affected hip, or for ankylosis.

#### The Röntgenological Changes in the Oesophagus in Tuberculous Mediastinitis.

**LLOYD E. HAWES** (*American Journal of Roentgenology*, May, 1944) states that tuberculous mediastinitis usually develops from infection in the tracheo-bronchial lymph nodes, and infrequently from rupture of a tuberculous focus in the spine, sternum or pericardial or pleural cavities. Though tuberculous mediastinitis is a rare disease, the types of tuberculosis which may lead to it are several. Active pulmonary tuberculosis is the most frequent source. The breaking down or reactivation of an old calcified or scarred mediastinal gland, when no active pulmonary tuberculosis is present, may be the cause in older patients. Tuberculous tracheo-bronchitis rarely gives rise to mediastinitis. The tracheo-bronchial lymph nodes, when infected with the tubercle bacillus, become enlarged and coalesce into inflammatory masses. The loose areolar tissue close to the nodes may also become infected, and numerous mediastinal abscesses may form. The periaortitis which develops, however, may not be purulent, but chiefly reactive, and may result in multiple adhesions and scars. The firm union of the nodes to one another is due to this periaortitis and later scarring. Normally the mediastinal connective tissue stretches loosely from the lymph nodes

to the trachea, bronchi, great vessels and oesophagus. After infection of this tissue, the resulting adhesions and scars may pull upon and stretch the oesophagus, or a scar or part of an inflammatory mass may wholly or partially encircle the oesophagus and lead to partial stenosis or a small area of rigidity in its wall. The enlarged lymph nodes may press against the wall or displace the oesophagus from its usual course. The infection may spread to the oesophagus; with tubercle formation in the wall, ulceration and final rupture into the oesophagus may occur. Several Röntgenological signs of active tuberculous mediastinitis have been described. Of these the classical sign is widening of the mediastinal shadow to the right and to the left. In tuberculous mediastinitis the oesophagus may be displaced by soft tissue masses, and pressure defects in the barium-filled lumen have been noted. The oesophageal mucosa may be involved, so that an irregularity of the normal mucosal pattern may be observed, in some cases so pronounced that carcinoma is simulated. The oesophageal wall in the involved area may be constricted or stretched. The stenosis is due to pressure of inflammatory masses or scarring; the stretching out is probably the result of adhesions. In some cases a number of small projections may occur, appearing either as points or as rounded waves from the involved segment of the barium-filled oesophagus. These projections are constant, although their size and shape may vary with the degree of barium filling. The pathological explanation of these projections is probably related to the scarring and adhesion formation in the periesophageal tissues. They are analogous in aetiology to traction diverticula.

#### Diverticulitis and Diverticulosis.

NORMAN P. HENDERSON (*British Journal of Radiology*, July, 1944) states that diverticula commonly appear during or after an attack of inflammation in a local section of the colon; he holds that it is this initial inflammatory attack or series of attacks that constitutes at least one method, but certainly not the only one, of causing weakening and a devitalizing effect on the bowel walls. This weakening eventually permits the mucosa to be forced through as herniated sacs at the weak points where lymphatics and blood vessels perforate the coats. It is emphasized that diverticulosis does not necessarily always commence with a preliminary attack of inflammation in the bowel, but can be precipitated by some process of weakening of the colon musculature, such as a nearby carcinoma, polypus or other tumour, or from some other devitalizing complications such as chronic constipation. Diverticulitis and diverticulosis occur chiefly towards the middle and later decades of life, and are perhaps seen more commonly in the male than in the female. With the improvement of radiological technique, thorough preparation of the patient (an important point) and close follow-up of patients after operation, it is found that the combined occurrence of diverticulitis and diverticulosis with carcinoma or polypus in the same patient is more common than was thought. It is the author's view that in most of these cases, if not in all, the carcinoma is the primary

disease which devitalizes the bowel wall and so paves the way for subsequent diverticulosis. In all cases in which a diagnosis of diverticulosis has been established, but in which no tumour growth has been found, periodical examination by opaque enema every year for the next three years is strongly advised. By that time (and perhaps in most cases before) one can be reasonably certain whether a tumour is or is not present. In fact, the presence of diverticulosis should be regarded in the light of a warning signal that further and more serious trouble may be on the way.

#### PHYSICAL THERAPY.

##### Grenz Rays in Dermatology.

S. M. BLUEFARB (*Archives of Physical Therapy*, July, 1944) states that Grenz rays are a useful therapeutic agent because so many are absorbed in the epidermis and the superficial layers of the cutis that the amount reaching the deep network of blood vessels need scarcely be taken into account. The biological effect of these rays is stated to differ from that of X rays in five ways: (i) Grenz rays produce erythema more readily; (ii) they give greater pigmentation; (iii) they do not cause epilation; (iv) they do not penetrate so deeply; (v) they cause an early drop in the number of leucocytes, which rapidly returns to normal. In the treatment of superficial skin conditions the Grenz rays are most useful; if they are used instead of X rays, it is possible to avoid injury to important organs and to glandular apparatus, such as hair roots, sebaceous glands, sweat glands, testes and eyes. As they do not produce epilation, they are of value in the treatment of dermatoses of the scalp. Serious damage due to overdosage does not occur. It is possible at one treatment to expose the whole body to Grenz rays; moreover, treatment can be repeated much more frequently than with other rays, and the cumulative effect with suitable doses is minute. Grenz rays present no danger to the therapist or technician and there is no possibility of X-ray shock. The greatest disadvantage is the persistent pigmentation that follows single or repeated doses; however, it is only temporary. Another disadvantage is that the size of the field of radiation is limited to about three inches in diameter, so that treatment may be time-consuming. Sequelae are uncommon, but mild atrophy and telangiectasia have been reported. If the dosage is kept within the originally stated limits (below 10 kilovolts and 10 milliamperes), undesirable reactions and late skin injuries rarely occur. The danger of sequelae can be largely avoided if comparatively small doses are employed; large doses are unnecessary. The author believes that any failures have been due to excessive dosage. He has obtained good results with fractional treatment; if this is employed, the cutaneous reaction is noticeably less and a larger total dosage can safely be given. The factors which produced an erythema were as follows: 10 kilovolts, 8 milliamperes, a skin-tube distance of 12 centimetres; in exposures of one minute's duration 240r were given. With these factors the average wave-length was approximately two Angström units. The author stresses

the fact that it is important for the doses to be quantitatively and qualitatively correct. The air acts as a filter in Grenz ray therapy, so that even a minute change in the focal skin distance results in an important change in the quality and also in the quantity of the rays. The time intervals between the various doses should be as follows: 60r to 120r, one week; 240r to 300r, two weeks; 300r to 600r, three weeks; 700r to 800r, four weeks; 1,000r and over, six to eight weeks. Grenz rays have been found safer than and superior to X rays in *nevus flammeus*, blepharitis, dermatitis of the external auditory canal, *lichen chronicus simplex* and scrotal and penile dermatitis; they have also been used after the maximum amount of X-ray therapy had been given in *mycosis fungoides*, psoriasis, *pruritus ani*, atopic dermatitis, chronic dermatitis and seborrhoeic dermatitis of the scalp.

##### Treatment of Tumours by Local Asphyxia and Thermal Modifications.

F. W. ALLEN (*Archives of Physical Therapy*, July, 1944) presents four more cases in which he has tested local asphyxia and thermal modifications in the treatment of tumours of various kinds. He previously showed, in a series of several thousand experiments, that suitable local asphyxia caused a considerable breaking down of all kinds of neoplasms and sometimes achieved an actual cure. The action is selective; the normal tissues about the tumour are merely inflamed, and not a single normal cell is destroyed. The only trial of the method on a human subject in this earlier series resulted in cure of a squamous cell carcinoma of the face. Several observations in the literature led to the belief that elevations of temperature may have an injurious effect on tumours, and interest was aroused by Temple Fay's investigation of the inhibition and regression resulting from cold. To stop the circulation by a tourniquet changes conditions, particularly in two ways: (i) it makes possible a more precise, uniform and radical through-and-through alteration of temperature; (ii) it changes and magnifies the thermal effects. It is now well known that asphyxiated tissues are preserved by cold, and also that when the metabolism of asphyxiated tissues is accelerated by heat, the destructive effect is so rapid that even brief elevations of temperature merely within the febrile range rapidly induce gangrene. Immersion in ice water protects tumours against the necrotizing influence of ligation, while immersion in warm water accelerates the destruction of both the tumour and the normal tissues. The author suggests that physical therapists may find other employment for these thermal influences in combination with asphyxia. The cases he reports illustrate a new use for them in the treatment of tumours—the application of cold to protect the normal parts of a limb and of heat to increase the injury to the tumour. He concludes that local asphyxia can produce selective and more or less complete destruction of certain tumours in accessible regions. He makes no claim that the method is at present more effective, safe or convenient than standard treatment; but he considers that further trials are worth while.

## British Medical Association News.

### SCIENTIFIC.

A MEETING of the New South Wales Branch of the British Medical Association was held at the Royal Prince Alfred Hospital on May 18, 1944. The meeting took the form of a series of clinical demonstrations by members of the honorary medical staff of the hospital. Parts of this report were published in the issues of September 9 and September 16, 1944.

#### Osteomyelitis Treated with Penicillin.

Dr. A. S. JOHNSON showed a male patient, aged twelve years, who had been admitted to hospital on April 30, 1944. He had sustained an injury to his left knee at football a week previously; the next day he felt ill and vomited, and pain was present around the knee, which became worse and was associated with abdominal pain. Since then he had been pyrexial, and pain in the region of the left knee continued; it was associated with malaise and shivering. On his admission to hospital, his temperature was 104° F. and his pulse rate 128 per minute; he was flushed and appeared very ill. Pain was present when an attempt was made to move the knee, and tenderness was elicited over the lower part of the femur, but there was no appreciable swelling or redness and no sign of fluid in the joint. No tenderness at all was present below the knee. He was given sulphadiazine tablets (of which he had twelve in all) until the next day. The condition was then regarded clinically as osteomyelitis of the lower end of the femur, and treatment with penicillin was commenced. At this stage the haemoglobin value was 110%, and the leucocytes numbered 10,200 per cubic millimetre, 82% being neutrophile cells. An X-ray film of the femur revealed no abnormality; but his temperature was 104° F., his pulse rate was 130 per minute, and he was delirious and extremely ill.

Blood was taken for culture, which yielded a growth of *Staphylococcus aureus*. Penicillin was given intramuscularly, the commencing dose being 40,000 units at 5 p.m. on May 1; 10,000 units were then given every second and third hour, so that a total of 120,000 units was given in the first twenty-four hours and a similar dose in the second twenty-four hours; then 100,000 units were given per day, until a total of 1,000,000 units had been given by 7 a.m. on May 10. General and local improvement was noticeable on May 2, with some lowering of the temperature; but on May 3 swelling and extreme pain were present over the lower part of the femur extending upwards, and it was thought that pus might be present outside the bone. Accordingly an incision was made over the lateral aspect of the lower part of the femur and four drill holes were made in the bone, but no pus was found. Attempted culture of blood-stained material from the drill holes gave negative results. Up till this time, and subsequently throughout treatment, the leg was kept at rest on a plaster splint.

Dr. Johnson said that general and local improvement continued, and the patient's temperature was normal on May 5, his pulse rate varying between 80 and 90 per minute. Since then the temperature had been normal except for one reading of 100° F., the pulse rate had averaged about 80 per minute, and the patient was looking very much better and feeling well; no pain or tenderness was present over the lower part of the femur or around the knee. Progress blood counts on May 3 and 6 showed the haemoglobin values to be 83% and 94% respectively, and the leucocytes to number 9,500 and 7,650 per cubic millimetre respectively. Attempted culture from blood taken on May 15 gave negative results. Dr. Johnson pointed out that the case was of interest, in that it was an example of staphylococcal septicaemia, presumably with a bone focus, which responded rapidly and favourably to penicillin.

#### Implantation Dermoid.

The next patient shown by Dr. Johnson was a male, aged forty-nine years, who gave a history of an injury to the ring finger of his left hand caused by a tram rail falling on it in 1927. He had sustained a lacerated wound on the front of the finger, which had healed; but three months later a swelling appeared at the site of the wound and persisted. In February, 1944, this swelling commenced to discharge, and he was admitted to hospital. Some infection had occurred and cheesy debris was also discharged from the swelling. Healing had eventually occurred, and at the time of the meeting the patient was in hospital again awaiting operation. Examination of the left ring finger revealed a soft slightly fluctuant lobulated tumour on the volar aspect

over the second phalanx. This was attached to overlying skin, but not to bone, and its dimensions were about one and a half inches by one inch by three-quarters of an inch. The tumour was regarded as an example of an implantation dermoid of the finger, onion-like layers of keratinized material having been discharged from it when the patient was previously in hospital.

#### Abscess of the Triceps Muscle.

Dr. Johnson finally showed a male patient, aged thirty-seven years, who had been admitted to hospital on April 10, 1944. Two weeks before he had noticed soreness of the upper part of the left arm, and then he felt a lump. There was no definite history of injury, and he was otherwise perfectly well.

On examination, a hard swelling, fairly well circumscribed and about two and a half inches long, was found on the inner aspect of the upper part of the left arm. There was no redness, the tumour was moderately tender, but not hot, the skin was freely movable over it, and it was movable on bone. The swelling appeared to be in the region of the triceps muscle, and the patient was apyrexial. It was considered likely that it had been present longer than the period during which the patient had noticed it, and was thought to be a neoplasm, probably a neurogenic sarcoma. Operation was performed on April 12. A longitudinal incision was made over the swelling, and after some time pus was found issuing from the postero-lateral aspect. The lesion was then recognized as an abscess and drained through a tube on the posterior aspect of the arm, the main wound being closed. Culture of the pus yielded *Staphylococcus aureus*. Dr. Johnson said that the patient had made a good recovery, the wounds had healed, and there was now no tenderness, and function was normal. The case was unusual as an example of pyogenic abscess occurring spontaneously in the triceps muscle and simulating neoplasm.

#### Basisphenoidal Tumour.

Dr. GARNET HALLORAN showed a male patient, aged thirty-three years, who in June, 1942, had begun to suffer from headaches, especially about the occiput, for which he was treated by the injection of "Novocain". By May, 1943, the pain had spread to his right shoulder and arm. He was depressed, morose and sleepless. His neck became stiff. By October, 1943, his condition had deteriorated. He developed an anxiety state, lost much weight, and for the first time noticed nasal obstruction and bilateral deafness. The headache and pain extending to the right arm continued. On March 10, 1944, the Wassermann test failed to produce a reaction. Throughout March, 1944, a neutrophile leucocytosis as high as 31,000 per cubic millimetre was present. Greatly increased nasal secretion and X-ray evidence of sinusitis in the posterior as well as the anterior skull sinuses were also present. Examination of the cerebro-spinal fluid revealed no evidence of meningitis. Dr. Halloran said that the patient was probably suffering from acute pansinusitis at that time. On April 18 the provisional diagnosis was made of malignant neoplasm of the basisphenoidal area. A large post-nasal tumour was palpable; it resembled carcinoma in consistency. Some mechanical immobilization of the soft palate was present. Nasal polyp of red fleshy appearance were visible about the choanae. Biopsy of the polyp and small palpable glands in the neck was not permitted. Palsy of the right abducent nerve was evident. Severe Vidian nerve neuralgia persisted on the right side, with stiffness of the neck, mental depression and emotional instability. Dr. Halloran said that the tumour was inoperable, and a palliative course of deep X-ray therapy was commenced. Great temporary improvement was evident; the tumour was obviously radio-sensitive. Vidian nerve pain was greatly diminished, function had returned in the right abducent nerve, and the tumour and malignant polyp had shrunk, leaving a clear airway.

#### Chronic Diffuse Frontal Osteomyelitis.

Dr. Halloran's second patient was a male, aged twenty-nine years, who had been admitted to hospital on October 19, 1943. He gave a history of pneumonia and acute orbital phlegmon three months previously. On examination, extensive frontal osteomyelitis was present with a fistula discharging above the left eyelid, bilateral chronic frontal sinusitis and disorganization of the left eyeball.

Left radical frontal sinus operation with sequestrectomy was performed. The flaps were left widely open. The organisms grown in culture were: a pure culture of hemolytic streptococci, a moderate amount of *Staphylococcus aureus*, and scanty Gram-positive cocci in pairs.

In January, 1944, there was no X-ray evidence of a sequestrum, but a further X-ray examination on March 8 was strongly suggestive of sequestration of the inner table of the frontal bone. The frontal incision was reopened, the sequestrum was removed, and an extradural abscess was disclosed over the frontal pole. The frontal flaps were anchored widely open. The organisms grown in culture were a hemolytic streptococcus (group A) and *Staphylococcus aureus* (coagulose positive).

A course of penicillin treatment was commenced on April 19. One million units were given over ten days by intramuscular injection every three hours. Penicillin packs were inserted into the wound once a day. The macroscopic appearance of the wound quickly changed. Within twenty-four hours it appeared clean and dry and granulations appeared healthy. The wound was sterile at the end of treatment, except for the presence of *Bacillus proteus*. Within three days, however, hemolytic streptococci reappeared, and again three days later the cultural picture was identical with that before penicillin treatment was commenced. The wound was then being irrigated each day with "Monacrin" (1/1,000) and acetic acid (1%). Dr. Halloran said that the organisms had only been inhibited by penicillin, but further spread of the osteomyelitis was being watched for.

#### Left Fulminating Pansinusitis; Orbital Abscess; Left Optic Atrophy.

Dr. Halloran finally showed a male patient, aged thirteen years, who had first complained of watery nasal discharge on the left side; on the same day the left eye became swollen, and vision was blurred. The left eye was quite blind within thirty-six hours of the onset of the illness.

On the patient's admission to hospital, there was gross oedema of the left orbit and of the face. Pus was pouring from the left nostril. The patient was acutely ill, his temperature rising to 103° F. X-ray films revealed gross opacity of the left antrum and ethmoidal cells. From material from each nostril was obtained a pure culture of hemolytic *Staphylococcus aureus*. The left eye was blind and proptosed. Much oedema of the upper lid was present. The pallor of the left disk indicated a retrobulbar pressure lesion. The left posterior ethmoidal area was found to be necrotic and oedematous, and through this area pus was draining profusely into the nose. Drainage appeared to be adequate. An external ethmoidal incision was made into the orbital abscess. The acute oedema began to subside, and the gross nasal discharge lessened. The upper eyelid remained swollen, however, and three weeks later a radical frontal sinus operation was performed on the left side. The sinus was found to be grossly diseased, the mucosa being polypoidal, and a track was followed from the swollen upper eyelid to a small sequestrum in the frontal floor. Six weeks later all discharge had ceased; but advanced optic atrophy persisted in the left eye.

#### Adreno-Genital Syndrome and Dementia.

PROFESSOR W. S. DAWSON showed a female patient, aged thirty-one years, who on March 28, 1944, has been admitted to the psychiatry pavilion from the Parramatta Mental Hospital for special investigation. Professor Dawson said that Dr. E. T. Hilliard had supplied the following information about the patient's earlier history. She was born when her mother was aged forty-two years. Her father's sister had always had amenorrhoea, and one sister menstruated rarely before marriage. The patient was fairly well educated. Photographs showed that she was normal in build at the ages of sixteen and nineteen years. The menarche occurred when she was thirteen years old; menstruation was regular for years, but at the time of her admission to the Parramatta Mental Hospital it occurred only once or twice a year and the flow was scanty. The patient was certified insane on account of delusions of persecution by wireless and screaming attacks. The growth of hair on her face had commenced in 1939; the menstrual flow had been scanty since 1940. Obesity had been present since 1940; it was not increasing. Obvious growth of hair on the face and body had occurred. X-ray examination revealed that the pituitary fossa was somewhat deeper than normal, and that some approximation of the anterior and posterior clinoid processes had occurred. No calcification was noted in the adrenal glands. Vaginal examination revealed considerable enlargement of the *labia minora*, but no other abnormality. Mentally, the patient was dull, lethargic and indolent.

Professor Dawson went on to say that on the day after the patient's admission to the Royal Prince Alfred Hospital, X-ray examination revealed that the *sella turcica* was

normal in size and shape. On March 31 her basal metabolic rate was 10% and her weight was eleven stone eight pounds; a sugar tolerance test revealed a slight lag only. On April 6 X-ray examination revealed no evidence of calcification in the adrenal glands; apparently slight enlargement of the liver had occurred, but no other abnormality was found. On April 16 the blood urea content was 22 milligrammes per centum, and on April 27 the urea concentration was 26 milligrammes per centum. On May 3 a urea concentration test was carried out and an excretion urogram of the renal tract was prepared; both renal tracts were normal, and both kidneys had excellent excretory function. A plain X-ray film showed that both kidney shadows were in a normal position; the shadows were reniform in shape, and the left kidney was larger than the right. The psoas outline was normal on both sides. There was no shadow suggestive of calculus in either renal tract, and no evidence of calcification in the adrenal glands was found. On May 4 the excretion of ketosteroids was three milligrammes in twenty-four hours. Professor Dawson said that the patient had been reported as having passed only 350 cubic centimetres of urine in forty-eight hours, and the comment had been made that was difficult to believe that that was possible, in view of the patient's size and her normal renal function; the androgen content of the urine was extremely low.

On May 15 the haemoglobin value was 13.3 grammes per centum, or 91%; the leucocytes numbered 8,450 per cubic millimetre. On examination of the patient, she was seen to have a profuse growth of fair hair on her face, forearms, trunk and lower limbs. The upper limbs and trunk were fat, the legs less so. Her face was plump and she had a somewhat florid complexion. No abnormality was detected in the central nervous system, and no abnormal masses were palpated in the abdomen. The systolic blood pressure was 150 millimetres of mercury and the diastolic pressure was 90. Mentally the patient was vegetative; she did not speak unless spoken to, and exhibited no sign of distress.

Professor Dawson said that the syndrome described by Cushing, and assigned by him to basophil adenoma of the pituitary gland, was characterized by amenorrhoea, adiposity and hirsuties, together with raised blood pressure, erythrocythemia and bluish *striae atrophicae*. However, Broster, Gardiner-Hill and Greenfield, in 1932, showed that the triad of amenorrhoea, adiposity and hirsuties might be associated with adrenal hyperplasia. In that case the excretion of androgens in the urine was raised above the average of 4.0 to 14.6 milligrammes per day, and the adrenal cortex was fuchsiphilic. In the case under discussion there was no X-ray evidence of pituitary changes, the blood pressure was not raised, there was only a slight lag in the sugar tolerance curve, and no erythrocythemia was present. On the other hand, estimation of the amount of androgens excreted had proved unsatisfactory, owing to the patient's failure to cooperate in the collection of samples of urine. Professor Dawson thought that laparotomy would be justified for diagnosis, and for the removal of an enlarged adrenal gland if one was found. Whether the disappearance of masculine features would be associated with a return to mental normality was a matter for speculation. A further attempt to collect urine for ketosterone estimation yielded only about 400 cubic centimetres in forty-eight hours, so no estimation was made.

#### NOTICE.

THE General Secretary of the Federal Council of the British Medical Association in Australia has announced that the following medical practitioners have been released from full-time duty with His Majesty's Forces and have resumed civil practice as from the date mentioned:

- Dr. Douglas Miller, "Craignish", 185, Macquarie Street, Sydney (June, 1944).
- Dr. Ashleigh O. Davy, "Harley", 143, Macquarie Street, Sydney (October 3, 1944).
- Dr. J. C. Squires, Atherton District Hospital, Atherton, Queensland (February 13, 1944).
- Dr. Leonard H. Ball, 32, Collins Street, Melbourne (May 1, 1944).
- Dr. Geoffrey A. Cook, 130, Whitehorse Road, Balwyn, Victoria (March 21, 1944).
- Dr. John Devine, 57, Collins Street, Melbourne (July, 1944).
- Dr. Robert Fowler, 14, Parliament Place, Melbourne (September 12, 1944).
- Dr. B. H. McColl, 401, St. George's Road, North Fitzroy, Victoria (March, 1944).

Dr. A. T. Pearson, Corryong, Victoria (June 21, 1944).  
 Dr. Ian M. King Scott, Tallarook Street, Seymour,  
 Victoria (January 20, 1944).  
 Dr. C. G. Shaw, 55, Collins Street, Melbourne (February  
 1, 1944).  
 Dr. B. Rosse Woods, Port Fairy, Victoria (August 23,  
 1944).

## Correspondence.

### CANCER.

SIR: In an article under the title "Is Cancer a Communicable Disease?", Captain Ludwik Gross<sup>(1)</sup> makes the suggestion that women of families with a history of cancer in their ancestry should refrain entirely from suckling their progeny.

He is led to make this suggestion by the well-known work of Bittner and other investigators, who, conducting their experiments largely with mice of a high mammary cancer incidence, found on fostering litters from such a line with females of a low cancer strain that there was an amazing drop in the development of cancer in the litters so fostered.

Even more interesting is a recent experiment in which Bittner followed up for five generations the progeny of females of a litter thus fostered. With this one act of fostering, subsequent generations not being so treated, the line was converted to a low cancer strain. One per centum of 165 descendants are stated to have developed tumours, the remainder dying at the average age of 16.9 months without neoplasms; of the 214 controls, 97% developed mammary cancer at the average age of 8.9 months. The converse has also been found to hold true, and mice from a low cancer strain fostered by females of a high cancer strain not only develop cancer in high percentage themselves, but so do their progeny. In other words, it is transmissible.

This work was begun in 1934 when Bittner suspected an extrachromosomal influence and rightly thought it to be conveyed by milk. His results have been confirmed by many other investigators.

In consequence of this Gross makes the interesting suggestion given at the beginning of this letter. He points out that the removal of the young must be immediate, a few hours' nursing being sufficient to vitiate the result.

Whether such a procedure will be effective in man cannot be foretold, but should be worth trying, even though results will not be assessable for many years. It will no doubt bring problems of feeding to vex practitioners, but in view of the incidence of cancer in the human population such problems should not be allowed to stand in the way.

The suggestion seems to be worth placing before a larger number of medical men and women than are served by the somewhat restricted circulation of the journal in which it appears.

Yours, etc.,  
 JOHN MAYO.

170, North Terrace,  
 Adelaide,  
 September 18, 1944.

### Reference.

<sup>(1)</sup> Ludwik Gross: "Is Cancer a Communicable Disease?", *Cancer Research*, Volume IV, May, 1944, page 293.

### BIOCHEMICAL METHODS IN SHOCK THERAPY.

SIR: The excellent articles in your issue of September 16 by Major A. E. F. Shaw and Major A. Daly Smith, and Lieutenant H. H. Kretschmar, on intravenous infusions and shock therapy are well worth careful reading by all concerned in the application of resuscitation measures. One hesitates to be critical in the face of what must represent a great deal of work and study, yet there is a number of points which invite comment, and in several respects conclusions differing from those reached by the authors seem justifiable.

It is remarkable that the authors have employed relatively complicated techniques in their various estimations, when an admirably simple, rapid and quite accurate method, eminently adaptable to field conditions, is available at any rate for plasma protein, hematocrit and hemoglobin determinations. In its application the specific gravity of

whole blood and plasma is measured against serial dilutions of a copper sulphate solution of known density. The three values desired may then be either calculated from the figures obtained or read off direct from a line chart prepared for the purpose. Under suitable conditions the whole procedure will occupy only a few minutes.

The various cases quoted by the authors are highly instructive, Case IV especially offering a salutary reminder of the necessity for correct and vigorous resuscitation treatment in cases of severe burns. Unquestionably, the nine litres of serum given in a little over two days saved this man's life, whereas blood in similar quantity would have been fatal.

Case V, however, demonstrates the opposite situation. It is difficult to accept the conclusion that here the use of blood was deleterious, and that serum would have produced better results. Obviously this man had lost a large quantity of blood, externally and internally, and so a great reduction of blood volume had occurred. The dangerous hypotension, with virtually normal biochemical findings at the initial testing, provided absolute confirmation of this diagnosis. The indication was for the administration of blood in large amounts, say three or four litres, serum being valuable only as a temporary measure pending the provision of blood. It was not the 400 cubic centimetres of blood that caused this patient's pressure to fall at 12.45 a.m., but rather his being turned over in bed when his circulatory mechanism was in a most precarious state of instability. At this time, too, the hematocrit reading showed that hemodilution was developing, and although this process was obscured by further transfusion and the effects of two anaesthetics on the day after injury, it was well established on the following day and was progressive thereafter. The hematocrit reading on the seventh day, despite the prior administration of 1.7 litres of blood and the operation of the patient's natural recuperative powers, demonstrated that the initial hemorrhage must have been very severe. To claim that massive serum therapy is preferable to blood in such circumstances seems unwarranted.

The conclusion that plasma loss had occurred in Cases I and VIII also seems to be dubious, in that the normal figures for these patients were not known beforehand. If it is assumed that in Case I the normal hematocrit reading was 45%, and that the normal plasma protein level was 6.0 grammes per centum (quite reasonable possibilities), then the findings on December 31, 1942, show virtually no differential variation. So, too, in Case VIII, with assumed normals of 45% and 6.5 grammes per centum respectively. It is evident that so small a variation in plasma protein content as 0.5 gramme per centum will produce a large error in such calculations. Caution is therefore necessary in estimating protein loss on the basis of an arbitrary normal figure.

Yours, etc.,

S. V. MARSHALL, M.B., Ch.M.,  
 D.A., M.R.A.C.P.

143, Macquarie Street,  
 Sydney,  
 September 18, 1944.

### AN EXAMINATION OF A PUBLIC HEALTH REGULATION GOVERNING SCARLET FEVER.

SIR: After reading the article, "An Examination of a Public Health Regulation Governing Scarlet Fever", by R. J. Jackson, Armidale, New South Wales, in your journal of September 23, 1944, I thought it might be worth while to bring before the notice of your readers the modern trend of thought about "Scarlet Fever". It is very well put in *The Lancet*, May 27, 1944, page 711, where a report of a circular by the Essex Epidemiological Committee is quoted as follows:

#### Scarlet Fever.

For some months the Essex Epidemiological Committee—whose members include representatives of general practice, the public health service and hospitals—has been considering the definition of "scarlet fever". After consultation with the Ministry of Health, it has asked its chairman, Dr. W. A. Bullough, MOH for the county, to circulate the following memorandum to local MOH's, hospital officers and practitioners:

It is generally agreed that "scarlet fever" has become so benign as to make largely unnecessary its administrative control as previously exercised. It is recognized

also that this condition is only one of the many manifestations of infection with group A hemolytic streptococci and that there is no justification for isolating in hospital individuals suffering from streptococcal sore throat associated with a rash, whilst ignoring those with a similar sore throat and no rash. To do so does not protect the community, but it is impracticable to remove to hospital all those suffering from streptococcal sore throat, and it follows that the needs of the particular patient should decide whether or no he should be given hospital accommodation.

Cross-infection, which is largely responsible for the complications of "scarlet fever", does not occur if the patient is nursed at home, and this is one of the main reasons for advocating home treatment of this disease wherever possible.

I do not think that cross-infection is responsible for all the complications of scarlet fever. *Otitis media*, tonsillitis and adenitis, which a patient may develop after the first two weeks, are, however, probably due to cross-infection. The circular continues:

Although the welfare of the patient is the first consideration, other aspects of the problem cannot be ignored, and one of these is the possibility of the spread of infection by milk or foods which are consumed uncooked, whilst another is the risk of infecting a woman in the later stages of pregnancy. Where, therefore, a case of "scarlet fever" occurs in a household, a member of which is a food-handler, or where there is a woman approaching confinement, it would be inadvisable to have the patient nursed at home. It is, therefore, recommended that admission (of cases of "scarlet fever") to hospital should be determined by: (1) the severity of the disease; (2) the home nursing facilities; (3) the employment of another member of the household in the preparation or distribution of food for public consumption; (4) the approaching confinement, say within one month, of any female in the patient's home.

It is highly desirable that the public should be informed of the altered view now taken by the medical profession of "scarlet fever", and it is felt that this can best be done by the family doctor.

Yours, etc.,

N. J. SYMINGTON,  
Lecturer in Infectious Diseases,  
University of Sydney.

The Prince Henry Hospital,  
Little Bay,  
New South Wales.  
September 26, 1944.

#### SOME OBSERVATIONS ON TUBERCULOSIS CONTROL.

Sir: I wish to support the remarks of Dr. Hilary Roche, Dr. Henzell and Dr. D. R. W. Cowan relative to the control of tuberculosis in Australia.

I have been connected with the Westwood Sanatorium since 1930, and only too sadly realize the ineptitude of the powers that be in this State with regards to tuberculosis. Westwood Sanatorium is the only one in existence here, and most of the cases admitted are in an advanced condition; such a thing as even a clinic does not exist, and it is to be hoped that before long something definite will take place.

It is certainly a definite step if an Australian National Tuberculosis Association is to be established, and it should follow on similar lines as the National Association for the Prevention of Tuberculosis, London (N.A.P.T.), and this would be an incentive to carry on the work.

Australia does not form part of "L'Union Internationale contre la Tuberculose" (headquarters in London at present, formerly Paris). I have always considered this a great pity, and so far I am the only Australian member. I was elected through the late Sir Robert Philip, of Edinburgh, and Dr. Ferdinand Bezaçon, of Paris.

Yours, etc.,

J. H. BLACKBURN.

Westwood Sanatorium,  
Westwood,  
Via Rockhampton,  
Queensland.  
September 12, 1944.

## Post-Graduate Work.

### WEEK-END COURSE AT PARRAMATTA.

THE New South Wales Post-Graduate Committee in Medicine announces that a week-end course will be held at Parramatta in conjunction with the Central Western Medical Association on Saturday, October 21, and Sunday, October 22, 1944. The fee for the course will be £1 1s., except for members of the defence forces. Those wishing to attend should make application to Dr. K. S. M. Brown, "Brislington", 12, George Street, Parramatta. Members of the defence forces intending to be present must notify Dr. K. S. M. Brown by Friday, October 20, 1944. The programme of the course will be as follows:

#### SATURDAY, OCTOBER 21.

##### At Parramatta District Hospital.

- 2 p.m.—Registration.
- 2.30 p.m.—"Recent Advances in Sulphanilamide Therapy", Dr. H. Maynard Rennie.
- 4 p.m.—"Induction of Labour", Professor B. T. Mayes.

#### SUNDAY, OCTOBER 22.

##### At Parramatta District Hospital.

- 10 a.m.—"Hernia", Dr. S. H. Lovell.
- 11.30 a.m.—"Lower Segment Caesarean Section", Professor B. T. Mayes.
- 2 p.m.—"Acute Abdominal Emergencies", Dr. S. H. Lovell.
- 3 p.m.—"Suppurative Diseases of the Lung", Dr. H. Maynard Rennie.

## Naval, Military and Air Force.

### APPOINTMENTS.

THE undermentioned appointments, changes *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Number 193, of September 28, 1944.

#### ROYAL AUSTRALIAN AIR FORCE.

##### Reserve: Medical Branch.

Flight Lieutenant R. J. C. Kristenson (264418) is transferred from the Active List with effect from 15th August, 1944.—(Ex. Min. No. 244—Approved 20th September, 1944.)

##### Citizen Air Force: Medical Branch.

The probationary appointments of the following Flight Lieutenants are confirmed with effect from the 16th July, 1944: J. I. Guenther (287414), A. J. Gumley (287424), A. D. Packer (287403), K. C. Porter (287404), R. T. Steele (287406), C. D. Swaine (287405), R. Fruchtmann (277480).

THE undermentioned appointments, changes *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Number 197, of October 5, 1944.

#### CITIZEN AIR FORCE.

##### Reserve: Medical Branch.

The following officers are transferred from the Active List with effect from the dates indicated.—Squadron Leader W. D. Cunningham (261896), 14th August, 1944, (Flight Lieutenants) C. F. Bernard (264592), 18th August, 1944, L. Elias (273736), 21st August, 1944.—(Ex. Min. No. 255—Approved 4th October, 1944.)

## Notice.

THE Mental Hospitals Department of New South Wales, in conjunction with the Section of Neurology, Psychiatry and Neurosurgery of the New South Wales Branch of the British Medical Association, will hold a clinical meeting at the Mental Hospital, Callan Park, Rozelle, on Thursday, October 26, 1944, at 2.15 p.m. All members of the medical profession are invited to be present.

## Australian Medical Board Proceedings.

### QUEENSLAND.

THE undermentioned have been registered, pursuant to the provisions of *The Medical Acts, 1939 to 1940*, of Queensland, as duly qualified medical practitioners:

- Chenoweth, Thomas Norman, M.B., B.S., 1944 (Univ. Queensland), 22, Abbott Street, New Farm, Brisbane.  
 Comino, Lefteri, M.B., B.S., 1944 (Univ. Queensland), 14, Sydney Street, Mackay.  
 Coronos, George, M.B., B.S., 1944 (Univ. Queensland), Hotel Coronos, Charleville.  
 Hamilton, Hilda, M.B., B.S., 1944 (Univ. Queensland), Rome Street, Yeronga, Brisbane.  
 Lavers, Kenneth Wilcox, M.B., B.S., 1944 (Univ. Queensland), 126, Russell Street, Toowoomba.  
 Murphy, Clement John, M.B., B.S., 1944 (Univ. Queensland), 6, Dublin Street, Clayfield, Brisbane.  
 Philippott, Iris Gertrude, M.B., B.S., 1944 (Univ. Queensland), General Hospital, Brisbane.  
 Smythe, Darrel John Clare, M.B., B.S., 1944 (Univ. Queensland), Wilkie Street, Yeerongpilly, Brisbane.  
 Whitchurch, William John, M.B., B.S., 1944 (Univ. Queensland), 15, Hetherington Street, Herston, Brisbane.  
 Wood, Percy Norman, M.B., B.S., 1944 (Univ. Queensland), 431, Sandgate Road, Albion, Brisbane.

## Nominations and Elections.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

- Grieve, Peter William Harvey, M.B., B.S., 1943 (Univ. Sydney), 3/14 Australian Field Ambulance, Australia.  
 O'Reilly, Merrick John Justyn, M.B., B.S., 1939 (Univ. Sydney), Post Office Residence, Parramatta.  
 Caro, Ewen Stanley, M.B., B.S., 1944 (Univ. Sydney), Western Suburbs Hospital, Croydon.  
 Schofield, Catherine Phyllis, M.B., B.S., 1943 (Univ. Sydney), Women's Hospital, Crown Street, Sydney.  
 Turk, Harvey Coleman, M.B., B.S., 1942 (Univ. Sydney), 114th Australian General Hospital, Goulburn.  
 McGuinness, Alan Edward, M.B., B.S., 1935 (Univ. Sydney), 2/9 Australian General Hospital, A.I.F., Australia.  
 Vanderfield, Geoffrey Keith, M.B., B.S., 1944 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.  
 Taverner, James Maurice, M.B., B.S., 1944 (Univ. Sydney), 519, Payne Place, Albury.  
 Goswell, George Basil, M.B., B.S., 1942 (Univ. Sydney), (Flight Lieutenant, number 267233) Group 247, Birdum, Northern Territory.

## Obituary.

### NEWPORT BENJAMIN WHITE.

WE regret to announce the death of Dr. Newport Benjamin White, which occurred on October 3, 1944, at Melbourne.

### EDWARD HENRY FYFFE.

WE regret to announce the death of Dr. Edward Henry Fyffe, which occurred in October, 1944, at Melbourne.

## Books Received.

"Polyglot Glossary of Communicable Diseases: Contribution to the International Nomenclature of Diseases"; League of Nations, *Bulletin of the Health Organisation*, Volume X, Number 3, 1943-44, by Y. Biraud, M.S., M.D., D.P.H.; 1944. 6" x 9½", pp. 556.

"Forward Surgery in Modern War", by W. H. Ogilvie, M.A., M.D., M.Ch., F.R.C.S., Hon. F.A.C.S., Hon. F.R.C.S.(C). 1944. London: Butterworth and Company (Publishers) Limited. 8½" x 5½", pp. 99, with illustrations.

## Diary for the Month.

- Oct. 16.—Victorian Branch, B.M.A.: Hospital Subcommittee.  
 Oct. 16.—Victorian Branch, B.M.A.: Finance Subcommittee.  
 Oct. 17.—New South Wales Branch, B.M.A.: Medical Politics Committee.  
 Oct. 17.—Victorian Branch, B.M.A.: Organization Subcommittee.  
 Oct. 18.—Western Australian Branch, B.M.A.: Branch Meeting.  
 Oct. 19.—South Australian Branch, B.M.A.: Council Meeting.  
 Oct. 19.—New South Wales Branch, B.M.A.: Clinical Meeting.  
 Oct. 19.—Victorian Branch, B.M.A.: Executive Meeting.  
 Oct. 24.—New South Wales Branch, B.M.A.: Ethics Committee.  
 Oct. 25.—Victorian Branch, B.M.A.: Council Meeting.  
 Oct. 26.—New South Wales Branch, B.M.A.: Branch Meeting.  
 Oct. 27.—Queensland Branch, B.M.A.: Council Meeting.  
 Nov. 1.—Victorian Branch, B.M.A.: Branch Meeting.  
 Nov. 1.—Western Australian Branch, B.M.A.: Council Meeting.  
 Nov. 2.—South Australian Branch, B.M.A.: Council Meeting.  
 Nov. 3.—Queensland Branch, B.M.A.: Branch Meeting.  
 Nov. 3.—Victorian Branch, B.M.A.: Legislative Subcommittee.  
 Nov. 7.—New South Wales Branch, B.M.A.: Organization and Science Committee.

## Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

**New South Wales Branch** (Honorary Secretary, 135, Macquarie Street, Sydney): Australian Natives' Association; Ashfield and District United Friendly Societies' Dispensary; Balmain United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phoenix Mutual Provident Society.

**Victorian Branch** (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

**Queensland Branch** (Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

**South Australian Branch** (Honorary Secretary, 178, North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

**Western Australian Branch** (Honorary Secretary, 205, Saint George's Terrace, Perth): Wiluna Hospital; all Contract Practice appointments in Western Australia.

## Editorial Notices.

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